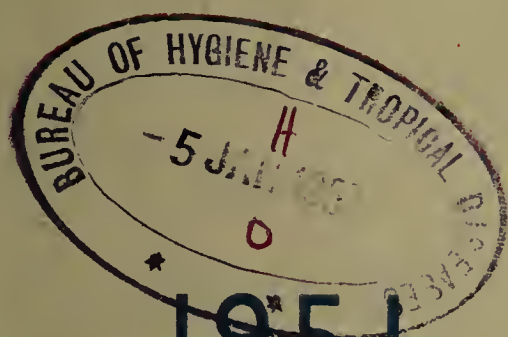


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1951

The Annual Report of the Medical Department of the Colony of Singapore



General Hospital—H.E. the Governor laying the Foundation Stone of the new Out-patient Department in the presence of the Rt. Hon. the Secretary of State for the Colonies

Public Relations



COLONY OF SINGAPORE

MEDICAL DEPARTMENT ANNUAL REPORT 1951

BY

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PART I
GENERAL



Public Relations

Preliminary Training School for Nurses

CHAPTER ONE

INTRODUCTORY

THE year 1951 was of particular interest in three respects: a return to the record health statistics of the year 1949: the real start on the Medical Plan approved in 1948: and the serious results of delay in the implementation of that Plan.

The crude death and infant mortality rates reached an all time record in the year 1949. The rise in these rates shown in the 1950 return was again reduced approximately to the 1949 level (crude death rates 1949 11.84, 1950 12.12, 1951 11.88: infant mortality rates 1949 72.04, 1950 82.23, 1951 75.15). In all other respects 1951 seems to be the record year so far in the statistical field. The health of the Colony can again therefore be classed as exceptionally good. This must be a matter for congratulation in view of the lack of implementation in the Medical Plan and the steady and incredible pressure on an organisation designed for a far smaller population and one not expected to demand western medicine on any scale. Thus while the actual present population is now some 40 per cent greater than the pre-war, the number actually seeking treatment is well over twice the figure then demanding attention. In addition the present generation expects—and rightly—a far higher standard and degree of service. The surprising fact is that an accommodation and staff designed for the pre-war set of conditions have so far met the challenge forced on it over the post-war period without breakdown: that a reasonably good service has been provided under the remarkably difficult circumstances which have prevailed. The nursing recruitment drive towards the end of the year achieved at long last that response which has always been anticipated by the medical directorate. The tragedy was that the latter was not in a position to take full advantage of the situation. As it was, every square inch of ward accommodation not in use for patients had to be turned into, or temporarily designed for, accommodation for nurses, midwives and housemen. And 1952 must show a still greater pressure in this direction with some 50 medical students sitting for their final examination in June for the first time. Thus the laying of the foundation stone for the new Out-patient Department, the new Nurses Home and for new Medical Officers quarters at the General Hospital on the 11th December, 1951, by His Excellency the Governor in the presence of the Right Honourable the Secretary of State for the Colonies, was a matter of vital importance in the medical history of the Colony. Until these and other urgent projects are completed, reliance may have to be placed on pre-fabricated huts.

Action was started in 1950 on the new Base Medical Store and Manufactory and on the first stage of the Leper Settlement (Trafalgar Home). The former project was reaching completion by the end of the year while good progress has been made with the second stage of the three stage scheme for our lepers. Storage space for medical equipment and material and the manufacture of essential drugs had become a matter of the first importance before the advent of stockpiling for civil medical defence. The introduction of the latter would have created an impossible situation without the scheme now nearing completion. Leper accommodation has been a serious problem since 1946 and has been met with a series of improvisations since that date. Every year has added to the problem as more and more have come forward for treatment. Our leprosy patients will not receive that attention which is their due until the third stage of this scheme has been completed.

Action on the fantastically busy Women's Diseases and Maternity Hospital (Kandang Kerbau Hospital) was also approved for 1952 and the year under review saw the *plans* for a new out-patient division and new wards at this institution nearing completion.

Complaints have been made from time to time about delay in admission and delay in out-patient treatment. These indicate an increasingly critical general public and are to be welcomed as such, but it is difficult for a very hardworked and by and large willing staff working in buildings totally unsuited to present and modern conditions not to suffer from a sense of added frustration and irritability in consequence. No out-patient departments as the term is understood today ever existed in Singapore's hospitals until the Rotary Tuberculosis Clinic appeared in the grounds of the Tan Tock Seng Hospital in 1949, and as this is still the only modern structure in this respect constant improvisations have had to be effected to deal with a five hundred per cent increase in attendances over the post-war period. Out-patient attendances at hospitals now number over 500,000 annually as compared with less than 90,000 in 1938. In-patients have increased over the same period at our main acute hospitals from some 26,000 to over 41,000 annually on a comparative assessment, and personnel intake has only improved recently.

Permanent Government service doctors and others in the hospitals excluding Medical School staff and housemen:—

1941		1951	
<i>Permanent</i>	<i>Others</i>	<i>Permanent</i>	<i>Others</i>
46	2	55	7

The Medical School is only just about to turn out the expected increased post-war numbers. Those qualifying up to the present are the pre-war students. For the course is a six-year one and we are only even now in the sixth post-war year. The most serious factor in present circumstances is the lack of sufficiently experienced personnel—both in doctors and nurses. 1946 saw a large number of experienced local doctors leaving the service and since then there has been a steady drain by retirement on reaching the age limit. In the nursing field experienced nurses are always leaving for various personal or family reasons an unfortunate peculiarity of any female staff, but more marked in the East than elsewhere. These have been replaced by the more or less newly qualified. While such personnel does not carry more responsibility in Singapore than elsewhere, the far smaller proportionate number of the really experienced available here is the important factor. The good December intake will enable the 'block system' of training for nurses to be adopted for the first time in our history. This method will give the student nurse that extra time which makes all the difference. The Block System means that a number of nurses are relieved of all ward duties from time to time and returned to the classroom for concentrated lectures and studies.

The suggestion made in some quarters that more experienced staff should not be made available in the health and quarantine services at the expense of the hospital side suggests a complete misunderstanding of a national service and the duties to be performed by that service. So far the health and quarantine precautions in Singapore have been running on a dangerously low margin and a failure in these respects is likely to have far more serious public repercussions than is generally imagined.

Permanent Government service doctors and others in the Government Health Division:—

1941		1951	
<i>Permanent</i>	<i>Others</i>	<i>Permanent</i>	<i>Others</i>
21	—	8	9

That these divisions are not as much in the public eye as the hospital service is a tribute to the watch and ward which has been accomplished so far over activities of paramount importance to the public welfare. The Public Health Conferences which have become such an important feature of our local machinery have reiterated time and again that no relaxation in carrying out the minimum regulations laid down by the World Health Organisation can be contemplated in Singapore with the very small trained staff available. As it is, the rapidly expanding educational scheme cannot be met medically on anything like the scale which is called for without a very considerable increase in the staff and accommodation for this division. While no major infectious disease occurred throughout the year, the recent typhoid outbreak and the increase in diphtheria with the occurrence of plague and cholera in neighbouring territories indicate the need for the never ending supervision which only an adequate health division can exercise. The dangerously unvaccinated state of the local population came up for review recently by the Public Health Conference. Small-pox is an ever present danger: that malaria is virtually absent does not mean that a disastrous epidemic could not sweep the Colony. The increase in diphtheria indicates the necessity for a further concentration on public co-operation in this respect.

Modern out-patient departments demand a network of ancillary services such as almoners and physiotherapists which require an extensive follow-up and domiciliary scheme if sufficient hospital beds are to be available under the most comprehensive of building schemes. That in 1951 three almoners were trying to cover the work done by ten times that number in the United Kingdom explains the slow increase in a service which only came into being three years ago. In addition the housing situation in Singapore with a large proportion of the population still living in shockingly over-crowded cubicles does not as yet lend itself to expansion at the same speed as similar services in the United Kingdom.

The Singapore Medical Plan seeks to double the present facilities in all medical fields and will take us quite a long way on that road to a free service for all so ardently desired by so many of the community. Perhaps it is not out of place to reiterate our aims in this direction. Briefly the Medical Plan seeks:—

- (a) the modernisation and improvement and enlargement of all the existing hospitals;
- (b) the building of a new hospital centre which will include a general hospital block, a children's block and a women's diseases block;
- (c) the improvement and expansion of Tan Tock Seng Hospital to an 800-bedded tuberculosis centre, with a chest surgery unit, and the building of a tuberculosis sanatorium hospital with 300 beds for the more chronic cases;
- (d) an expansion of the Venereal Disease Hospital cum Out-patient cum Dispensary scheme;
- (e) a really modern settlement for lepers;
- (f) a modernisation of our mental institutional treatment with special facilities for mental defectives;
- (g) a chain of really attractive child and maternity clinics throughout rural Singapore; the more important of these to be combined with static dispensaries and to form rural health centres in the fullest sense of that word;
- (h) a modern quarantine and dangerous infectious diseases station;
- (i) a first class school medical and dental clinic service with mobile units forming a chain linking it to all the schools in the Colony.

All this will be welded into a workable whole so that eventually the health of every section of the population will be sufficiently catered for. With the best will in the world this cannot be done under existing conditions, and the fact cannot be ignored.

Over the post-war decade, particular attention has been paid to tuberculosis and venereal disease, and far, far more is being accomplished in these respects than ever before in our local history. That yet more cannot be done in these directions at the moment is due to the fact that undivided attention cannot be given to one disease at the expense of other equally important medical conditions without serious repercussions on the general public health. The principal causes of death continue to be bronchitis and pneumonia, infantile convulsions, pulmonary tuberculosis and acute bowel conditions *in that order*, with a reduction in the number of deaths by about half the pre-war figure in all. The drop in deaths from pulmonary tuberculosis and infantile convulsions is particularly satisfactory: 1,096 per million as compared with 2,288 in the former, and 1,342 and 2,393 in the latter. The drive to improve the public health in these directions and in many more will be considerably accelerated when we see the approved Plan materialise in bricks and mortar. As the facilities envisaged and the treatment available improve, so will more and more cases be dealt with. Some 500 beds are now provided for tuberculosis alone, as compared with 100 before the war, and these will be further increased in 1953 when the 'South Winds' mansion and grounds outside the City so generously donated by Mr. Lee Kong Chian have been turned into the first stage of the 300-bedded sanatorium scheme envisaged under the Medical Plan. At the moment over 1,000 cases are on the waiting list of our existing tuberculosis institution at Tan Tock Seng Hospital. As many as possible of these receive domiciliary relief and assistance under the special scheme which is now a permanent part of the social services of the Colony. In fact, this scheme is the first of its kind in the East. Tuberculosis received very little individual attention before the war, but now a large and expanding organisation operates under the Government and under the Singapore Anti-Tuberculosis Association. Lack of accommodation and staff have necessitated a centralisation of treatment on curable cases. The Tuberculosis Advisory Board has taken up the case of the incurable with the Secretariat of Chinese Affairs from the point of view of further voluntary assistance in this direction.

During the year B.C.G. inoculation came into being as a permanent part of the preventive service. It was initiated as a Government measure under the auspices of the World Health Organisation and the United Nations International Children's Emergency Fund by a special team of experts which trained local personnel. There has been criticism about the tardy introduction of this measure and latterly a question of its usefulness. The very latest advice has been followed and statistics are being compiled for the necessary follow-up and investigation which must be a part of such a scheme. Apart from staffs particularly exposed to the danger of tuberculosis infection, inoculation is confined to the new-born and to children in schools and clinics after the consent of parents has been obtained. 49,067 tests had been completed by the end of the year with 18,784 inoculations. A campaign of this sort is in the nature of a long term protective measure and even today many of the experts sound a note of caution. In consequence, in the words of the Ministry of Health in London, the intention is not to encourage general inoculation of the public at large, but to concentrate on those groups of the population considered to run a more than average risk of tuberculosis infection.

The surgery of tuberculosis received attention, in that preliminary talks were conducted with World Health experts on an expansion of present facilities in this direction, with the provision of a separate chest surgery unit. This is a part of the Medical Plan, of course, and will be developed accordingly at the right moment. With the advent of an Orthopædic Surgeon and a proper Orthopædic Unit in due course a good deal of expansion in this direction is soon anticipated. In the meantime more and more attention has been paid to such cases in special out-patient clinics and in the expanding surgical physiotherapy division.

A special post-polio unit was developed during the year—a very important and necessary venture in view of the steady number of cases of this disease which continues to be reported and the definite possibility of continuing explosive outbreaks. So far there has been an epidemic approximately every 30 months, with the last of these occurring at the end of 1950. So an expanded scheme to cover the prolonged attention which must be given if a rapid increase in our numbers of cripples is to be avoided is in the process of elaboration by the Social Welfare Council.

The venereal disease campaign continues to be centred on a 70-bedded institution in one of the poorest and most overcrowded sections of the City, with ancillary clinics and a rural travelling dispensary, based on a strict voluntary system with mutual confidence between patient and staff. Within the limits of a steadily expanding scheme the results have been extraordinarily successful in that attendances have doubled over the past few years with women as well as men. In fact, female cases are five times the pre-war figure. A particular feature of the Singapore control is the social follow-up through a team of female supervisors which visits homes. It cannot be stressed too clearly that this disease is as much a social and economic evil as a medical one; and that future control lies largely in the rehabilitation centres, in boys and girls clubs, and the better housing of the people. Crowded cubicles with complete lack of privacy breed such conditions as this. Penicillin continues to fulfill its early promise as an effective therapeutic agent in both syphilis and gonorrhœa but the simplified and shortened treatment now available has its danger from the psychological point of view, unfortunately.

Two new Child and Maternity Clinics in the rural areas were in the process of completion by the end of the year. These are the first of the 19 clinics and dispensaries to be provided under the Plan. Thus, of the 40 rural centres at which child and maternity supervision is provided, 7 will soon be housed in reasonably good buildings. As new buildings go up, the service will be extended by further temporary centres in the more isolated parts of the Colony, and particularly on the smaller outlying islands. These centres are being designed with proper quarters for nurses and midwives, so that the necessary additional staff to complete a visiting circuit for the whole 300,000 people outside the City limits can be achieved. Eventually, every rural birth will be attended to in a proper professional manner in the home or in hospital. Even at the moment, with the poor accommodation provided, 7,708 births out of a total of 13,337 were dealt with by the Government staff in the rural areas. Although 1951 showed a welcome reduction in the infant mortality rate in all the communities, the comparatively high Malay rate is still a disappointment. The difficulty is to get sufficient Malay girls of the right calibre to come forward and to resume work after qualification. The high rate in the first three post-natal months shows that bad dietary habits still play a disproportionately active part in the infant mortality picture. This is considered to be a particular feature in the Malay figures. Maternal mortality showed a further significant drop to the record low figure of 1.6 per 1,000 total births. The fact that the maternity hospital division dealt

with 17,906 cases in its 200 beds over the year speaks for itself. The effort that is continuing, to cover as many births in the Colony as possible with its present inadequate accommodation, must be recorded as a tribute to the staff concerned.

This rural scheme also envisages a static dispensary service to be run in conjunction with these welfare centres, and a concentration of health inspectors, hospital assistants and anti-malarial overseers in addition to sisters and nurses and midwives working from specific district headquarters.

Mental disease again received special attention and a scheme was inaugurated to improve nursing in this connection. There is no comparison with any previous decade in this field of work, and the patients in our mental institution now receive much added care and attention. Before the war, the circumstances prevailing really meant little more than a minimum of attention to hundreds of inmates, while the Japanese reduced the numbers and the care they received to a farce—a mere handful of chained-up individuals living in squalor. The most modern methods of treatment have been introduced, but we still await the real occupational therapy which such patients should get and which is a part of the Medical Plan. The introduction of the completely new legislation which has been completed will further modernise our institutional outlook. There is no question that mental illness is fast becoming a major problem in Singapore and the stress and strain of modern life are not likely to reduce its magnitude.

Institutional feeding received further attention, but the outmoded kitchens which still exist in our hospitals render further progress difficult until this part of the Medical Plan can be implemented. The provision of modern kitchens is a major and very expensive undertaking, however, and unfortunately must await more urgent improvements in other directions.

The nutritional state of the people was not forgotten. Indeed this question received an undue notoriety during the year through the publicity given to certain starvation cases admitted to the General Hospital. The admission of such cases from time to time must be a part of any large institution. The full and complete review of the cases by the Nutrition Council showed that all were the subject of some particular family disaster or some definite disease. They had no direct bearing on the problem of malnutrition as such. Nevertheless the possibility of some such occurrence was not overlooked, and the Council made certain recommendations to cover an emergency of this nature.

Voluntary aid by various societies and groups of citizens continued to be an increasingly satisfactory feature of the medical service, but attention has had to be drawn to the need for further assistance to the chronic sick who lie outside the scope of Government provision. Faced as it is with the many commitments which a large and expanding public service such as the Medical Department of Government finds inevitable, especially in view of the serious backlog of past neglect, it is clear that such assistance to the Government machine must be a factor of the utmost importance. No such organisation, however well organised, can even hope to cover all the commitments which may well be considered within its sphere.

Civil medical defence received increasing attention and a broad overall scheme with the necessary stockpiling was drawn up. A post for an officer for the specific purpose of implementing the scheme was approved towards the end of the year. It is hoped to finalise the necessary measures in the near future in consequence. The St. John Ambulance Association and Brigade and the Singapore Branch of the British Red Cross Society will have to play an important part in this connection. A necessary and essential programme of first aid and nursing training by the former is a part of the scheme envisaged.

The Medical Department deals with an essential public service. It cannot stand still. The population is growing daily; the public is becoming more and more health and hospital-minded. Within the Medical Plan lies the immediate answer.

Harry Lesser, C.B.E., in an introduction to a publication on the Health Service in the United Kingdom notes that 'only those of us who have had a part to play in its organisation can realise how stupendous it is. The remarkable thing is that the scheme works so well. Difficulties, of course, there are: mistakes and miscalculations there were bound to be. But has there not also been a wonderful measure of achievement?' How true of Singapore!

It is interesting to record the following views of the Professor of Surgery on Hospital Development:—

The assumption that the Medical Plan which has been formulated for this Colony can only be assessed by the material aspects of that Plan is common. Bricks and mortar, bed numbers and new hospitals are regarded by the uninformed as the criteria by which hospital development can be measured. All too little regard has been paid to the functional as compared with the structural development.

Medicine does not stand still. There is continual growth and development. Old institutions and practice have to be modified, adapted, increased or abandoned to meet the needs of the day. So has it been in the hospital services of this Colony, but since the process is a gradual and continuous one it is only when the changes are reviewed over a longer period than that covered by annual reports that a true assessment of the degree of development can be appreciated. In the five years during which the present Director has been in charge of the Department the changes have been notable and it is therefore a suitable span to consider.

Today the General Hospital stands much as it did in 1941. There are signs of building activity but the functioning part of the hospital shows little or no change. So too is it with Kandang Kerbau and Tan Tock Seng Hospitals. But those of us who remember and have worked in these hospitals before the war are well aware of the alterations in the functioning organisation. While the anatomy is the same, the physiology has been radically altered.

It is readily seen from the figures published in successive annual reports that there has been a terrifying increase in the actual amount of work carried out in the hospitals in Singapore. The ever increasing numbers have been achieved without corresponding increase in staff as compared with the pre-war establishment. Less obvious but by no means of less importance has been the increasing magnitude of the work undertaken for many of the individual patients. The actual man-hours of work now involved in the care of a single case is many times greater than ever previously. That this should have been attained requires explanation.

The answer lies in the adoption in 1946 of the unit system within the hospital by which greater efficiency was secured. From the purely administrative point of view the main consideration might be the ability of the staff to increase the volume of work which they could undertake, the more efficient segregation of patients within the wards of the hospital and the improvement in the supervision of ward work by senior members of staff. But there is another aspect of the question. The advances in knowledge of disease within the past twenty-five years has been greater than ever before. Developments in methods of diagnosis and of the treatment of a patient have so vastly increased the demands upon the doctor that today the more advanced forms of practice can no longer be carried out by individuals working in comparative isolation and alone. It has become necessary to develop teams of workers each of whom assumes a special responsibility and each of whom may well be peculiarly skilled in some particular branch of work. It is by this differentiation of function within the team that each member of it is able to contribute his best to the efficiency of the team as a whole.

The adoption of this system is not without its implications. Within the hospitals it has meant the adaptation of old buildings for new purposes, it has meant the utilisation of old facilities for new functions and it will necessitate alteration of a structural character within the hospitals if the new organisation is not to be handicapped in future years. The organisation, improved as it has been, has suffered from shortages of staff, and from the difficulties of rehabilitation after a devastating war, but the important achievement has been the establishment of an organisation which is basically sound and which, as temporary handicaps are relieved, will be able to expand to meet the ever increasing demands made upon the hospitals by the public. It may rightfully be claimed therefore that we have utilised the years of waiting for the structural change to develop the functional organisation of the future hospital services of the Colony.

Within each unit are specialist officers who together constitute a team and this in itself carries certain implications. It creates the chance to place within the unit younger officers who can be trained and gain experience under a guidance which will enable them in future years to assume wider duties and greater responsibilities.

It was with these things in mind that three years ago a start was made with the creation of an orderly and graduated hospital establishment, within which men at different levels of experience and responsibility could find appointments suited to their attainments, and while affording opportunity for further advancement, would serve well the needs of the hospital organisation.

The creation of the University has also brought forward an opportunity to make a new approach to the problem of training the future specialists and consultants of Malaya. Those who would go forward to the more specialised branches of the practice of medicine, or surgery, or obstetrics, or of the many other specialised spheres of work which are developing today must serve a long apprenticeship if they are to maintain the worthy tradition of highest possible standards. There must be the study of the theoretical basis of modern practice which leads to the obtaining of higher qualifications which are the minimal hallmark of the specialist. There must be long experience gained under guidance without which the confidence and knowledge of the consultant is not obtained. It is the purpose of those who plan the hospital services of the Colony and the Federation that not only shall men of high qualification and experience be the hospital specialist staff but that there shall be opportunity for those who seek to become specialists to have the chances and facilities to do so. It is in this connection that the hospitals of Singapore and the University of Malaya play their complementary parts.

There has been accepted a plan whereby there will be in the teaching hospitals of Singapore a very generous number of posts created for selected specialist trainees. These appointments which will normally be held immediately after the house appointments can be extended up to four years and during that period opportunity will be afforded to study the basic subjects. These appointments then meet many of the requirements listed above. Those who hold them will receive their training in the basic subjects within the sphere of the Faculty of Medicine of the University while the clinical experience will be gained in the wards and laboratories of the hospitals. The man thus trained will thereafter be required to proceed overseas on study leave to acquire that broadening of experience and insight into his subject which wider contacts alone can secure and to obtain those higher qualifications which will be his passport to higher appointments.

But more is still required to meet the needs of the man who has travelled thus far but still has to gain experience before he assumes the full responsibilities of the consultant. For him posts have been created which will afford ever increasing responsibility and wider experience in the larger specialist hospitals and from which he can proceed to full specialist posts in due course.

The significance of these developments is profound. There has been created a scheme of training which eliminates handicaps of former years, which ensures that those who seek specialist practice can, if they avail themselves of the opportunities offered and prove their merit, look forward to a life continuously spent in their chosen branch of work, and leading to posts of highest responsibility.

Specialisation is ever increasing, and while there are disadvantages, none can deny that within certain limits the process is both inevitable and necessary. Within the General Hospital and the other hospitals of the Colony the process has been extended of recent years as opportunity and necessity dictated. To the pre-war specialities of Medicine, Surgery, Obstetrics, Radiology, and Ophthalmology and Social Hygiene, have been added Departments of Oto-Rhino-Laryngology, Anæsthetics, Tuberculosis and Orthopædic Surgery.

For long the requirements of Ear, Nose and Throat work were met by the efforts of one who starting and indeed continuing to bear the responsibilities of general surgery, developed this work to the standard of a speciality, but it was only after his resignation that it became necessary or desirable to separate the speciality more completely from other work and assign it to the charge of one who has no other duties. The volume of work in this branch is in itself sufficient to warrant this.

Similarly the organisation of the activities involved in orthopædics and traumatology has become so great as to require the concentration of the manifold divisions within one department. The creation of a Chair of Orthopædics in the hospital has resulted.

The post-war years have seen a growing interest in tuberculosis by both the medical profession and the public. Voluntary effort by the public has provided in these past five years the fine modern and growing clinics sponsored by SATA and Rotary. These clinics are centres of education and diagnosis and their therapeutic efforts would be curtailed were it not for the development of Tan Tock Seng Hospital as a sanatorium.

Noteworthy has been the development of the lesser specialities and ancillary services. Anæsthetics now ranks as a speciality and the services of the skilled anæsthetist are the *sine qua non* of much modern surgery and gynæcology. A blood transfusion service is essential in any large hospital undertaking major work and this is now functioning in Singapore. There is increasing importance attached to physiotherapy, occupational therapy and diversional therapy. Today these are all represented in our hospitals. An almoner service has been introduced of recent years and forms the link between the hospitals and the social services.

The nursing services too, without which no medical organisation could exist, have seen development and change. Newer methods of training, increased opportunity and more modern distribution are all indications of the adaptation of old services to modern needs.

One of the most significant post-war developments has been the greater part which the staff of the hospitals is now called upon to play in advising on matters of policy and organisation. It is in no way denigratory to an administration to say that those who are actually undertaking the clinical and hospital work are able to offer advice which may be of very real value. The opportunity afforded to the staff to place before the D.M.S. their views on many matters is greatly appreciated by them and it is hoped may have been of value to the administration. Above all it is the opportunity for the development of a greater team spirit in the hospital service on which the ultimate success of the service depends.

The introduction of the Medical Plan in 1947 was the recognition of the material shortages of the hospital services of the Colony. The initial steps of that Plan are only now in a material sense being taken. New departments and hospitals are still to be built, but in assessing the progress of the past five years the delays in material achievement should not blind us to the functional successes. Indeed it would have availed little to have had the buildings if the development of an organisation suited to the new demands of today and tomorrow had not first been secured and tested.

These are years of planning and it may well be that the future will demand modification and alteration in the plans which have been made. It has been said that a hospital is outmoded on the day when the foundation stone is laid. The D.M.S. will be leaving Singapore in the near future and much that he would have liked to see will not have been accomplished. But in his reflections on what he has done, and I trust others will reflect likewise, he will be able to claim credit for the re-organisation of the internal structure of the hospital work and function in a manner calculated to meet the needs of today and to be the basis of the expansion within the foreseeable future.

The Government Medical Services cover the entire hospital organisation of the Colony except the Infectious Diseases Hospital which is under a form of joint City Council and Government administration; all air and sea quarantine arrangements; the rural health division of some 300,000 persons; and the school medical and dental services. These are controlled by a Director of Medical Services, with a Deputy Director, a Chief Health Officer and a Chief Medical Officer.

The Director was an *ex-officio* President of the Medical Council of the Colony of Singapore and the Federation of Malaya; Registrar of the Medical Practitioners; Chairman and Registrar of the Dental Board, Singapore; Chairman of the Hospitals Board; Chairman of the Pharmacy Board, Singapore; Chairman of the Public Health Conference; Chairman of St. John Ambulance Association and Deputy President of the Singapore Branch of the British Red Cross Society. He was a member of the Legislative Council throughout the year and Chairman of the following special committees which were formed to deal with special problems: venereal disease, blood transfusion, tuberculosis and U.N.I.C.E.F. He was also a member of the Council of the University of Malaya.

The Colony of Singapore consists of Singapore Island with a number of small adjacent islands, including Christmas Island and the Cocos-Keeling Group in the Indian Ocean. It came into being under the constitutional reforms of 1946.

Christmas Island is situated in the Indian Ocean and is a densely wooded area of some sixty square miles, with a small population consisting of a few hundred Chinese and Malays working in exporting the deposits of phosphate of lime found on the island. There is a medical officer and a well equipped hospital.

The Cocos-Keeling Islands consist of twenty-seven coral reefs, only two of which have any practical significance. They lie some 700 miles south-west of Java and about 550 miles distant from Christmas Island. One is used by the Cable and Wireless Company as a station and the other by Malay labourers and their families working the large coconut plantations on the islands. There is a resident medical officer.

The climate of Singapore is relatively good in spite of a close proximity to the equator. It is characterised by a uniform temperature varying from 80 degrees to 90 degrees Fahrenheit and a high average humidity of some 84 per cent. The island is flat without hills of any consequence. While there is no dry season the rainfall is considerably increased during the north-east winter monsoon. The average annual rainfall is within the hundred inch range, January being a particularly wet month.

The island is some 27 miles in length and 14 miles in breadth, and about 217 square miles in area with a population of just over a million.

An acknowledgment is due for the assistance given to the Director in the preparation of this report by various members of the staff of the Medical Department and of the Faculty of Medicine of the University of Malaya. Particular thanks are due to the Government Printer, to the Registrar of Malayan Statistics and to the Public Relations Secretary in this connection.

CHAPTER TWO

ADMINISTRATION

THE difficulty in administration has continued to be the meeting of the ever increasing pressure from a large concentrated public with an organisation staffed and housed on a system designed to cater for a population of half the present size. An excellent service has been built up within these very serious limitations.

The approved Medical Plan was designed for a population of a million and this number has now been passed. That complaints must arise under such outmoded conditions is not surprising and particularly so when the undue proportion of comparatively inexperienced staff is added. The deficiencies which exist have been fully advertised by the medical directorate itself: what is surprising is that the organisation runs as smoothly as it does: that it has maintained the burden so satisfactorily.

The whole medical problem in Singapore must be assessed against this background—a background which only more bricks and mortar and the influence of time on the inexperienced can change. That a truly remarkable improvement in the health picture has occurred over the past war decade—that a phenomenally increased amount of work has been dealt with over the same period—these are the facets in the picture which must be accepted by the public. The public must also realise that such advances cannot be continued indefinitely without the increase in accommodation and staff which the acceptance of the Medical Plan demands. That the staff will be forthcoming eventually is evidenced by the large increase in the number of medical students sitting for the first time in the finals in 1952: by the marked success of the limited nursing recruitment campaign in November 1951/January 1952. The latter was limited by the accommodation available and even then this was stretched to dangerous limits by overcrowding in hostels and wards well beyond modern and accepted standards.

Following the December Medical examinations and the December recruitment of nurses it became possible for the first time in our local history to organise a proper system of out-patient control, and a system of nursing training whereby sufficient study time could be allowed.

The public now expects—and rightly—the most modern standards of treatment and accommodation. This cannot be attained under the existing conditions however. They cannot be attained until the Medical Plan has sufficiently advanced. The danger of marking time is even more apparent in the field of public health. The stage has been reached where not only is an ever present danger enhanced but the risk of institutional disease is added. Thus the relief which the laying of the foundation stone for the new out-patient department and a new nurses home by His Excellency the Governor of Singapore created in the minds of the medical directorate cannot be overstressed. The results of these and other advances will not be really felt until 1953 however; from then onwards the medical service to the public should be steadily improved.

By the end of the year 20 housemen were in residence or were about to become resident. This is an improvement on any period since this scheme was introduced in 1949. July 1952 should see at last a full complement in this respect with some 50 students sitting for the final. As the local Medical School should turn out about 50 graduates yearly from that date Singapore

should have enough men and women for all normal purposes, in the not too distant future, including the demands which will be created by the Medical Plan provided the Federation position can be satisfactorily met. Up to the present only 115 doctors have graduated over the post-war decade and a majority of these have not entered the Government service.* The question of *experience* is even more important. A large body of inexperienced personnel must have an adequate leavening of the experienced if public complaint is not to become excessively vocal—a factor which has been to the fore over recent months. No national medical organisation can operate without sufficiently experienced general duty medical officers and health officers—the backbone of any Service.

A new Medical Act was in course of preparation towards the end of the year as the full implications of the new legislation in the United Kingdom in this connection came to be studied. The United Kingdom has made a house-man's scheme an essential of registration and it is certain that all newly qualified personnel here will have to follow suit if reciprocity in registration is to be retained. This procedure can but be of benefit to public and doctor alike.

As the Medical School is now part of the University of Malaya, the report on its activities as such is omitted from this brief review. The University issues its own report which includes that of the Medical Faculty. Suffice it to say here that the financial aid system to students was continued. With regard to new students the Singapore Government awarded six new bursaries during the year—to five medical students and to one dental student.

The following shows the number of students in the different years:—

			<i>Medical</i>	<i>Dental</i>	<i>Pharmacy</i>
First year	...	...	52	23	15†
Second year	...	...	59	25	—
Third year	...	...	61	21	—
Fourth year	...	...	59	9	—
Fifth year	...	...	50	9	—
Sixth year	...	...	40	—	—
Total	...		321	67	15

85 new students were admitted to the Medical Faculty at the beginning of the academic year of 1951 (50 medical, 20 dental and 15 pharmacy). The admission of a substantially larger number yearly than in pre-war days has raised many difficult problems concerned with hostel accommodation, teaching staff and hospital facilities. It is frequently overlooked that more or less the same medical organisation has attempted to absorb three times the pre-war number of students.

Final professional examinations were held in June and December, 33 students qualifying in medicine and 5 in dental surgery. A yearly output of 50 means an average of over 65 to meet the 20 per cent wastage suggested by the Carr-Saunders Report. It will be noted that this figure has only been approached comparatively recently.

* NUMBER IN SINGAPORE AS ON 1ST JANUARY, 1952:

	<i>Doctors</i>	<i>Dentists (registered)</i>	<i>Pharmacists</i>
Private Practitioners ...	201	27 (qualified) 251 (unqualified)	... 55
Government ...	88	12 (qualified)	... 4
Housemen ...	24	—	... —
University ...	27	3 (qualified)	... 2
City Council ...	12	—	... —

† In addition 34 took the College of Medicine Diploma in Pharmacy which was conducted for the last time.

The lack of trained nurses again continued to be one of the most serious problems of the administration throughout the year, but the success of the very restricted drive towards the end of the year led to a reasonable hope that this state of affairs will be eliminated when sufficient accommodation is forthcoming and all out recruitment is possible for probationer nurses, for assistant nurses, and for tuberculosis nurses under the aegis of the Franciscan Sisters of the Divine Motherhood scheme. For the first time in local history some 60 student nurses joined the service for the January 1952 course. In addition arrangements were under way to take on suitable girls as these turn up in future, as experience has shown that if a candidate is not absorbed immediately she appears she drifts into other employment or loses heart. This policy will mean a steady and constant intake with periodic 'hunts' as courses start, those taken in between courses filling in time in various acceptable ways until then. The limitation now is lack of accommodation but it is clear that here again we shall have a large partially trained staff for a long period without sufficient experienced personnel unless a reasonable overseas recruitment is maintained until the Medical Plan is developed.

The long awaited Nursing Board came into being on 2nd April, 1951. Thus for the first time 1951 saw the creation of a true nursing profession with a proper Register and legal registration. Action was taken immediately to finalise the reciprocity with the Nursing Council of England and Wales, an objective which has been the subject of prolonged study and correspondence over many months.

By the end of the year 40 local nurses with the necessary character and experience had been promoted to Sister or recommended for this promotion out of a total Sister strength of 86. All the Sisters in the Health Division are now locally appointed and now one of these has been recommended for a Deputy Matron's post. There can be no lowering of standards for the fully qualified nurse from now on if reciprocity is to be maintained. Maintaining this should not be too difficult however, as many of our local girls show a considerable aptitude for this work and those now being selected for Sister are of really high quality.

The midwifery service continued to receive a concentrated study with a view to bringing the standard of training up to that in the United Kingdom. This has not been possible so far through lack of sufficiently trained personnel and lack of facilities. Facilities will not be adequate until the Maternity Hospital expands and more quarters are available. A special Sister is to be detailed for training purposes and a Midwifery Sister Tutor is being recruited through the World Health Organisation. A proportion of the midwives available are of good quality but in the past this service has not attracted adequately educated girls—an essential in this branch as elsewhere.

The idea is to build up reciprocity with the United Kingdom in the qualified nurse midwife case. It will be years before the non-nurse midwife can be considered in this connection in view of the needs of the rural areas for a particular type of practical midwife. The aim is to build up the midwifery scheme until every birth is dealt with either by the Maternity Hospital, by the Government or City Council midwives, or by the general practitioner and his midwifery assistant. That the policy of some attention to many instead of a full attention to a few has paid dividends is evidenced by the remarkable improvement in the infantile and maternal mortality rates over the post-war

years. This policy bears hard—very hard indeed—on the existing staff and accommodation, and a further improvement cannot be anticipated until more accommodation and so more staff become available. The Maternity Division of the Government Hospital dealt with nearly 18,000 cases in 1951 in some 200 beds, an all-time record and over double the 1947 figure, while the rural service covered nearly 8,000 births out of some 13,000 recorded. There is a Central Midwives Board which keeps in close touch with the Director of Medical Services.

An important part of the local nursing staff has always been the hospital assistant or male nurse. The future training of this body and its incorporation into the new scheme has not been overlooked. Male nurses will continue to be an essential part of our nursing service, but owing to the fact that they must be a more expensive proposition than females because of family and additional housing commitments, this section must be a comparatively small but well trained corps.

Mental nursing and control is a separate and very difficult problem in view of the neglect of past decades in this respect. The attempts undertaken to solve it have been noted in the previous chapter. It will continue to receive increasing attention in view of the increasing magnitude of the task which faces the directorate in this respect. Suffice it to say here that our mental patients are now receiving an attention undreamt of a few years ago. Again a further advance must await the Medical Plan. More accommodation, better kitchens, and much increased occupational therapy facilities are priorities. It is clear that reliance must continue to be placed on the hospital attendant for much of the nursing of our mental patients for a long time to come. In consequence the existing system was thoroughly reviewed and reorganised. A scheme with improved pay and better opportunities for selected attendants was introduced: more qualified male and female nurses are to be employed. To this end two selected hospital assistants were sent to the United Kingdom for training.

With the advance of the Medical Plan an advance occurred in the care of the Singapore leper patient, but until the scheme in course of action has been completed it will not be possible to give him that accommodation and treatment and observation modern technique demands. A remarkable step in this direction has taken place however. How much it is needed is evidenced by the surprising increase in the numbers demanding admission. The new problem of rehabilitation and absorption into the life of the normal community will have to be faced on an ever increasing scale as more and more cures are effected. Public opinion is still not trained to such an acceptance. This is a further task for the expanding almoner service. A special rehabilitation centre may well have to be called into being as an additional social welfare service.

As the Service expands a better type of hospital servant on a higher scale may well have to be recruited to undertake some of the tasks of the junior nurse. This has been reorganised already in the United Kingdom and is receiving some attention there. Progress in such a direction must of necessity be slow and cautious, however, if existing nursing standards in our institutions are to be maintained.

Two services which received increasing attention and which must be steadily expanded are the rural child welfare and maternity service and the

school medical service. Advance in both directions depends on adequate accommodation for staff, and especially on mobility of staff. Again we await the steady implementation of the Medical Plan in the former connection. The provision of the necessary vehicles must be linked with this to give that cohesion that an island-wide service with a comparatively limited personnel must have. How to attract staff to an unpopular branch of the service is a problem which has to be met. Whether time and an increasing general personnel will be the cure is an open question. But other more obvious means of attraction cannot be recommended until proper accommodation is forthcoming. The day has gone when nurses and midwives are prepared to live in tumble-down shophouses or worse.

Complaints in connection with hospital food and particularly in regard to the institutional feeding of nurses attracted unmerited attention. Quite a lot of study has gone into this problem over the post-war years and during 1951 the most careful reviews took place. All that can be done with the out-moded kitchens has been done: monotony cannot be obviated but even here an attempt has been made to overcome the difficulties. There is no question that patients and nursing staff alike receive an adequate diet, and that this is more than nutritionally sound. It is essential that such a staff should continue to receive a supervised diet. Apart from special diets, institutions must cater for the majority. In consequence the minority will continue to grumble.

Demands continue to be made to create dispensaries and even small scale hospitals in outlying districts. Of course it is impossible to implement such ideas however desirable until our general basic deficiencies have been met and for which the Medical Plan is designed. The idea is to have eventually health centres throughout the Colony with nurses, midwives, hospital assistants, dispensers and even sanitary inspectors and doctors based on them. All that can be done at the moment is to increase the nursing and midwifery attention that is given with a dispensary 'spread over' a number of centres and a doctor to a much larger number. To these must be added a much improved *public* transport service. There is an economic and a particular limit to the spreading of staff and buildings in all directions until the present Plan has been achieved. For the time being an expanded and expanding travelling dispensary and ambulance service must continue to attempt to meet much of the demand.

Quarters for staff at our present centres *must* be a priority. Lack of these limits proper recruitment of nurses and others, and until these are forthcoming sufficient numbers cannot be trained. Doctors cannot work without nurses and midwives and the latter will not come forward until accommodation, adequate and satisfactory according to modern standards, whether in town or country, is provided.

Claims for cure-all drugs and treatments are frequently made and the administration is constantly pressed for extensive expenditure in these directions. This applies particularly to such diseases as tuberculosis. It is clear that a good deal more work is essential before anyone can say whether such cures are major or minor aids to the accepted forms of treatment. The directorate is dealing with a public service and so must approach premature claims with caution. Certainly the world still awaits the really effective medicine for tuberculosis.

Malaria continues to exhibit a remarkably low incidence in the Colony but this result does not mean that any let-up is possible. Any relaxation

in present control measures would lead to epidemic manifestation without doubt. In fact the constant spread of population is creating an added and increasingly difficult problem demanding vigilance in this and other rural health measures. The lack of a sufficiently experienced staff in this connection has been a serious and added burden to a hard pressed medical administrative machine.

Study courses for the staff have received particular attention and quite a number of these have been arranged for the various grades. Again the only present limiting factor is the number of experienced personnel available. As this increases so will the number proceeding on study. One unfortunate manifestation in those returning is the tendency to expect the immediate implementation of the highest United Kingdom and American standards whether these are essential or not. The care of premature infants is a case in point. No one will question the necessity for added and special attention to such infants, but the problem is not one to be approached necessarily from that of a cold or even a temperate climate. This is one of the reasons for attention to a post graduate institution attached to the University of Malaya. The start of a local course for a post-graduate Diploma of Public Health is a welcome step.

The medical administrative machinery is intimately concerned with a number of Boards and Committees. The former are of a statutory legislative character: the latter advisory. The statutory bodies deal with many matters affecting professional conduct and procedure, and advise on legislative review in various directions. Thus the Pharmacy Board was instrumental in introducing a new Dangerous Drugs Ordinance which is designed to provide the statistics required by the United Nations, to control the import and export and to regulate the legitimate use of drugs for medical, dental, veterinary and scientific purposes. The Blood Transfusion Committee studies the endless campaign for more donors and devises drives for donors. All these bodies are playing an increasingly important part in assisting in the running of an essential public service, and the enthusiasm of their members is gratefully recorded.

In Civil Defence, a medical scheme, a hospital reserve, and the way the voluntary bodies such as the St. John Ambulance and the Red Cross can co-operate, were fully studied. An advisory committee on medical stock-piling operated on a monthly basis. The appointment of an A.D.M.S. Civil Medical Defence was approved towards the end of the year and this Officer will start work early in 1952 with the object of completing all the arrangements necessary to finalise a medical scheme to meet any national emergency. Civil medical defence is becoming an increasingly important problem, and one demanding a considerable, a detailed, and a specialised planning.

The post-war history of Singapore's Medical Service is one of a steady approach to the ideal of the State Medical Service demanded by some. The Medical Plan is designed as the first essential step in this direction. When this step has been attained we can approach the next. But an advance outside this concept must mean chaos and added inefficiency. Our aim, and the aim of our Plan is to diminish suffering and to prolong human life, to promote increased productivity, and to promote prosperity through essential health. 'That they may have life, and that they may have it more abundantly' is the objective of the medical administration.

TOTAL NUMBER OF OFFICERS AUTHORISED AND AVAILABLE IN JANUARY 1952

	Esti- mates	Perma- nent	Short Contract and Temporary	Gone or going on long leave including leave	Total to be available
<i>A.—Administration</i>					
Director ...	1	1	—	—	1
Deputy Director* ...	1	1	—	—	1
Chief Health Officer* ...	1	1 (acting)	—	—	1
Deputy Chief Health Officer ...	1	—	—	—	—
Chief Medical Officer* ...	1	1 (acting)	—	—	1
Chief Dental Officer ...	1	1	—	1	1
Medical Superintendent, Wood- bridge Hospital ...	1	—	1	1	1
Medical Superintendent, Kan- dang Kerbau ...	1	1	—	—	1
Assistant Director of Medical Services, Civil Medical De- fence ...	1	—	—	—	—
<i>B.—Hospital Division</i>					
Specialist Officers Grade A ...	5	5	—	—	5
Specialist Officers Grade B ...	20	13	—	1	12
Medical Officers ...	58	35	11 (2 contract)	2	44
Housemen ...	24	24	—	—	24
Matrons ...	8	8	—	—	8
Specialist Sisters, Almoners, etc.	24	7	3	—	10
Sisters—Expatriate ...	86	22	13	3	63
Sisters—locally appointed ...		33	—	2	
Nurses ...	387	299	61	3	357
Hospital Assistants ...	204	163	32	4	191
Qualified Midwives ...	30	14	8	—	22
Dental Staff including House- men ...	16	8	1	—	9
Pharmacists ...	9	4	—	—	4
Laboratory Assistants ...	24	16	—	1	15
<i>C.—Health Division</i>					
Health Officers ...	24	8	9	—	17
Supervisor, Public Health Works ...	1	1 (relief)	1	1	1
Chief Sanitary Inspector ...	1	1	—	—	1
Sanitary Inspectors ...	15	10	—	—	10
Matron, Grade I ..	1	1 (acting)	—	—	1
Matron, Grade II ...	1	1 (acting)	—	—	1
Health Sisters† ...	9	2	3	—	5
Health Nurses† ...	36	9	14	1	22
Hospital Assistants ...	14	9	1	—	10
Qualified Midwives ...	34	17	9	—	26

*Deputy Director: Dr. R. D. Gross until 11th April, 1951 and then Dr. J. Coutts Milne.

Chief Health Officer: Dr. G. H. Lowe followed by Dr. R. Calderwood followed by Dr. M. Doraisingham.

Chief Medical Officer: Dr. H. Scrimgeour followed by Dr. J. W. Winchester followed by Dr. R. Calderwood.

†Four Health Nurses are being recommended for promotion.

CHAPTER THREE

LEGISLATION

THE initiation, drafting, and passage through the legislature of any new legislation or even amendment of existing legislation is inevitably a slow and prolonged process. So that much of the legislative action referred to in the 1950 Annual Report continued into 1951.

However certain important measures were finalised and became law in 1951. An amending ordinance to the Registration of Pharmacists Ordinance and a revision of the registration of pharmacists rules were approved. The amending ordinance revised the constitution of the Pharmacy Board and the training and qualifications of pharmacists. Until this action there had been no changes in pharmaceutical training since 1933—the year the Registration of Pharmacists Ordinance was first introduced giving legal recognition to the pharmaceutical profession. Here it may not be out of place to include a brief note on the history of legislation so far as pharmacy is concerned. Prior to 1933 the only laws which concerned the sale and dispensing of medicines were a Deleterious Drugs Ordinance, an out-of-date Poisons Ordinance and a Food and Drugs Ordinance which was not enforced as far as drugs were concerned. The 1933 Registration of Pharmacists Ordinance gave official recognition to pharmacists and set up a Pharmacy Board with powers of registration and disciplinary action. An up to date Poisons Ordinance was enacted in 1938. This recognised pharmacists as sellers of poisons with special responsibilities in the case of retail sales of poisons to the public.

Amendments were also made to the Poisons Ordinance to permit the inclusion of new synthetic drugs. An extensive list of draft amendments have been suggested to allow for adequate control in the use of poisons including the use of sodium arsenite. A drafting committee of the Pharmacy Board had an Advertising and Sale of Medicine Ordinance and a Therapeutic Substances Ordinance under active consideration towards the end of the year.

Certain amending legislation under the sale of Food and Drugs Ordinance was submitted but later withdrawn. Both the Food and Drugs Ordinance, and the regulations under it, received careful revision with the objective of having the law in this respect brought up to date.

An Ordinance to provide for the Registration of Nurses for the sick was introduced for the first time in local history in late 1949, and regulations under it were approved towards the end of 1950. The new Nursing Board constituted under these regulations held its first meeting in April 1951.

Amendment of the existing Midwives Ordinance, and of the regulations thereunder, was the subject of a special study in view of the desire to create reciprocity with the United Kingdom in certain respects while meeting local difficulties in regard to the training essential for present developments. In consequence the regulations aim in particular at a course with special emphasis on problems of local importance.

The question of the registration of dentists with foreign degrees for the purpose of assisting in teaching at the University of Malaya was raised, and action to suitably amend the Dental Registration Ordinance in this respect was being finalised.

The task of preparing and introducing a new Mental Disorders Bill was almost completed by the end of the year. This Bill is designed to bring the existing Ordinance into line with modern knowledge and legislation. A major

change is the inclusion of a section permitting a person to be detained as a temporary patient without certification. The law regarding reception of mental patients into the Colony and removal of patients from the Colony is being brought up to date. In addition a Mental Deficiency Ordinance to regulate proceedings in cases of mental deficiency to provide for the reception, detention and care of mental defectives was being prepared. This is the first time such legislation has been contemplated. An Ordinance to amend the Penal Code by removing infanticide from the danger of being framed as a murder charge was also under discussion.

Work was continued on the drafting of legislation for the control of nursing homes and maternity homes.

A Medical Registration Bill which was introduced in the Legislative Council in 1950 and referred to a Select Committee during that year has been held in abeyance pending the publication of new legislation in this connection in the United Kingdom to cover a compulsory post-graduate training year. Towards the end of 1951 action was resumed on the receipt of the proposed measures from the United Kingdom so that proper reciprocity with that country can be retained.

The Medical Department was also very much interested in the new measures introduced during the year covering Civil Defence. Action proceeded in drafting rules covering the formation of a Singapore Hospital Reserve.

A note on legislation in connection with labour is included in the section on Occupational Health.

CHAPTER FOUR

STAFF WELFARE

THE well-being of the institutional staff of the Department continued to be the subject of active concern. The absence of any visible progress in the Department's programme for the housing of staff, apart from the token one of the laying of the Foundation Stone for the new Nurses Hostel, did not ease the task of the administration in trying to meet legitimate desires for accommodation. The Singapore Medical Services Union representing Hospital Assistants, Nurses, Laboratory Assistants, and Sanitary Inspectors took part in one meeting of the Department's Interim Joint Council and in various meetings with the Medical Directorate. Representatives of the Union also had a meeting with the Under Secretary representing the Honourable the Colonial Secretary and the Medical Directorate.

Meetings of the Nurses Representative Council continued to be held between the various grades of Nurses and the Principal Matron, Matrons and Sisters. At the meetings problems peculiar to the female nursing staff were discussed in a freer atmosphere than would have been possible in the more formal meetings of the Interim Joint Council.

The Singapore Medical Labour Union representing the large body of hospital servants met Secretariat and Departmental representatives on a number of occasions under the chairmanship of the Chief Personnel and Welfare Officer of the Labour Department to discuss conditions of service and pay. Improvement in regard to rates of pay of hospital servants is expected shortly and an increase in the percentage of the higher grades has been approved for 1952.

At Woodbridge Hospital a new division of hospital attendant with better salary terms was approved early in the year to replace the former Grades I and II of hospital servant.

The Senior Staff Committee of the General Hospital comprising the heads of the Units and of divisions in the various hospitals met regularly and discussed many matters concerned with the efficient functioning of the hospitals.

During the year six members of the staff went on overseas training including two for a mental nursing course and it is expected that some twelve more will go in 1952.

The various social and sporting activities of the hospital services continued. In September a fourth very successful Annual Sports Meeting was held at the University Ground, Sepoy Lines. Woodbridge Mental Hospital also held a well organised and attended sports meeting.

The Chief Welfare Officer to the Commissioner for Labour, whose assistance has proved of great value in dealing with the Department's staff welfare problems, arranged early in the year for a Personnel and Welfare Officer to take up duties in the Government Health Department. This officer concentrated his attention on the question of indebtedness and has been successful in tackling this problem. In this matter the Health Division Labourers' Co-operative Credit Society, Ltd., was of considerable assistance in advancing money to settle the debts satisfactorily, and where the labourers were not members of the Society, Government through the Financial Branch itself advanced sums. The increase in deposits shown by the Health Department Co-operative Society is an encouraging sign. It was a logical step when on 1st July the Departmental Welfare Officer was appointed Hon. Secretary of

the Co-operative Society. He was thus brought quickly into contact with a form of welfare which had done extremely good work in the past but which had been carried on under great difficulty owing to the increasing demands it made on the time of voluntary officials as its activities expanded

Approaches to the Welfare Officer have covered a multitude of subjects and friendly relations have been maintained with supervisors and staff. Regular visits are made to places of work and to quarters, and these have been extremely fruitful.

The Health Division Labourers' Co-operative Society continued to flourish. The comment in last year's report deploring the tendency of many to ignore free medical attention and instead to draw money from the Co-operative Society to meet private medical expenses was justified. It was however countered by the Society's President at the Annual General Meeting when he pointed out the foolishness of this expenditure and this is constantly reiterated by the Welfare Officer in his dealings with staff. The Annual General Meeting of the Society was held on the 20th October, 1951 and was attended by 321 members. A dividend of 6 per cent was paid out one week before the Deepavali holiday. Membership has increased over last year and it has been decided that the maximum loan to a member be increased from \$100 to \$200 providing that this does not exceed 80 per cent of the member's deposit. This provision assists in settling outside loans, which in the end exceed the savings and cause bankruptcy.

The credit balances at the end of 1951 and of 1950 were as follows:—

		<i>Year ended</i>		<i>Year ended</i>	
		<i>31st December, 1950</i>		<i>31st December, 1951</i>	
		\$ c.		\$ c.	
Post Office Savings	6,987 64	12,657	28
Chartered Bank	11,203 07	8,958	16
Cash in transit	1,588 85	1,862	03
Total investments	30,706 25	31,506	25
Membership	393	420	

CHAPTER FIVE

VOLUNTARY ORGANISATIONS AND ASSISTANCE

THE reference in this report to the activity of various voluntary bodies is an indication of their importance to the Medical Department. These non-Government organisations, as well as committees on which members of the public sit, cover a wide variety of essential assistance. The Department is indeed grateful for this help which is invaluable both in the field of actual therapy and in that of advice. Without this co-operation a difficult task would become infinitely more difficult.

In the field of therapy or active assistance the following should be particularly mentioned: the Ladies Diversional Therapy Unit, the Leper Welfare Committee, the Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association, the Tuberculosis Treatment Allowance Advisory Committee, the Blood Transfusion Committee, the St. John Ambulance Association and Brigade, the Singapore Branch of the British Red Cross Society and the St. Andrew's Mission Hospital for children.

During 1951 the Hospital Diversional Therapy Unit continued its excellent work in the Tan Tock Seng Tuberculosis Hospital and the Orthopædic (Children's) Hospital. These ladies have given very valuable service, and the instruction given to patients and the standard of work produced have been very high indeed. There is still considerable difficulty in getting Asian ladies to do ward work in the unit and efforts were made throughout the year to obtain new recruits. The great advantage in regard to language of Chinese ladies working in this unit cannot be over-emphasised. Thus the fact that two gave of their time is gratefully recorded. Siglap Orthopædic Hospital is now visited by three or four ladies of the unit every Thursday afternoon and children are taught embroidery and cross-stitch on canvas. This work was taken over by the unit in March 1951 when the American Ladies Association handed over as a separate entity. Knitting and felt toys proved the most popular crafts. Towards the end of the year the work was extended to the Trafalgar Leper Home. It is hoped that 1952 will see a further expansion in this essential ancillary medical service.

The Leper Welfare Committee extends aid to lepers outside the scope of departmental activity in the way of Christmas and other treats when presents are provided and by the provision of many desirable amenities. Leper children have been 'adopted' by people who give them special attention. A troop of Scouts has been formed. The Welfare Committee has continued its pocket money scheme for children in the Home. Efforts in this direction mean a great deal to a section of the community which needs increasing attention from the public. The constitution of the Welfare Committee was under discussion towards the end of the year and proposals for a form of registered association for the welfare of leprosy patients in the Colony were reaching finalisation.

One of the most difficult problems of the present day is that connected with tuberculosis. This is because it is such a large one, and one which has been so much neglected in the past. In consequence assistance to the growing service of the Government organisation cannot be too gratefully accepted. Apart from the ladies of the Diversional Therapy Unit, the Rotary Club of Singapore, the Singapore Anti-Tuberculosis Association and the Tuberculosis Treatment Allowance Advisory Committee deserve special thanks.

Rotary presented Government some time ago with a very fine and modern clinic for the diagnosis and out-patient treatment of tuberculosis. This stands in the grounds of Tan Tock Seng Hospital and has satisfied a long felt need for what is to become the main centre for the institutional treatment of this condition in the Colony. Rotary's gift may well be recorded as the first notable step in the accepted Medical Plan of the Colony.

The Singapore Anti-Tuberculosis Association continues to run an important diagnostic treatment centre in the city well away from the Rotary Clinic. The present premises used for this purpose have become quite inadequate and the Association has plans well advanced for a new building which will relieve the present over-crowding and allow for a considerable expansion in the scope of the work performed. These efforts constitute a significant step in the history of Singapore's advance towards the control of tuberculosis.

The Tuberculosis Treatment Allowance Advisory Committee has taken those steps for the relief of the economic factor in tuberculosis without which any tuberculosis organisation must fail—a truth which has long been realised in the United Kingdom and elsewhere. This aspect of our problem will be discussed at greater length in the chapter dealing with this disease. The scheme for domiciliary relief was outlined originally in a paper entitled *The Tuberculosis Policy for Singapore* laid before the Legislative Council in 1948. Its successful implementation by the Committee under the auspices of the Department of Social Welfare has meant a great amount of hard work. This Committee is to be congratulated on what has been done in starting and carrying on this essential service.

During the year discussions took place regarding the provision of a 'Home' for tuberculous destitute persons and for the chronic tuberculous patient. The Government Tuberculosis Board is strongly in favour of the provision of such a home to be set up by the Chinese community itself as the bulk of the people who would benefit by it would be Chinese. The Chinese Advisory Board has taken a very great interest in this project and it is hoped that its efforts will meet with early success.

The Blood Transfusion Committee came into being early in 1949 to advise and to co-operate with the Director of Medical Services in this important field of medical endeavour. Partly through its efforts the number of donors, built up from 287 in 1946 to 1,622 in 1948 and 2,946 in 1949, rose to over 3,500 in 1950 and 1951. The increasing number of Chinese donors is also a significant achievement in view of the local apathy to this form of voluntary effort. The Committee rejected the idea of paid donors and concentrated on obtaining new candidates through increased publicity and the distribution of certificates, with suitable badges for further gifts of blood. Silver medals were presented during the year to 12 donors who gave over ten gifts of blood. Propaganda by means of seasonal greeting cards, posters, and at the Safety First and Trade Exhibitions, helped to keep the needs of this vital service before the public. It has to be remembered however that while publicity campaigns have their value, what is really required is a sustained effort to obtain donor recruits.

The work of the St. John Ambulance Association and Brigade continued to expand. The number of First Aid Classes held and examinations conducted under the auspices of the Association was more than doubled over the period of this report. It was found necessary to restrict the number of men enrolled in the Brigade to some 1,200. On the other hand there are vacancies for women in the Nursing Divisions which still total less than 300. Once again the public gave generous support to the annual Flag Day and associated functions, and in all nearly \$20,000 was collected during the year. The

Government continues to give both organisations substantial financial support. The Association has undertaken to train all members of the Civil Defence Corps in First Aid.

A Singapore Branch of the British Red Cross Society was inaugurated in 1950 and to help its work Government gave grants of \$5,000 and \$3,000 for the Red Cross hospital car service and a deaf children's class respectively. The annual appeal raised a sum of over \$76,000, a large part of which is for a handicapped children's home. The work of the Branch included aid in emergencies, welfare work in hospitals, work for handicapped children and work for the aged—all social service work of the highest value and importance.

Both these organisations play a really important part in the medical and social fields in the day-to-day life of the Colony. In times of trouble and in emergency they must take an essential place as an auxiliary to the established Medical and Social Welfare Departments. The St. John Ambulance must become the backbone of the Civil Medical Defence Scheme. These are recognised organisations in all civilised communities.

Government Committees and Boards on which members of the public sit continue to play an important part in the medical and health development of the Colony. The Hospitals Board, the Tan Tock Seng Hospital Committee, the Medical Council, the Dental Board, the Pharmacy Board, the Nursing Board, the Nutrition Council and the Government Anti-Tuberculosis Advisory Board can be named in this connection. The Tan Tock Seng Hospital Committee functions outside the Hospitals Board which deals with all the other leading hospitals of the city because this hospital continues on the basis of a charitable trust. It has retained its distinctive and individual character ever since 1851.

The Public Health Conferences which have been a feature of the public health control of the Colony ever since the advent of the Civil Government in 1946 and the Venereal Disease Committee are composed of members of all the Services (Navy, Army and Air Force) in addition to the various Government Departments concerned. Representatives of the World Health Organisation, the Federation Medical Department and the Singapore City Council also sit on the former.

CHAPTER SIX

VITAL STATISTICS

POPULATION

COLONY OF SINGAPORE

(Excluding Cocos and Keeling Islands)

THE present population figure for mid-year 1951 is based on the actual 1947 census figure plus the migrational factor plus excess births over deaths since then. On this calculation the estimate is 1,041,933.

Details by race since 1911 are as follows:—

Year	Chinese	Malays	Indians	Euro- peans	Eura- sians	Others	Total
1911 (Census) ..	219,577	41,806	27,755	not available	..	..	303,321
1921 (Census) ..	315,151	53,595	32,314	6,145	5,436	5,717	418,358
1931 (Census) ..	418,640	65,014	50,811	8,082	6,903	8,295	557,745
1947 (Census) ..	729,473	113,803	68,967	9,279	9,110	7,512	938,144
1948 (Mid year) ..	749,591	116,364	69,474	9,660	9,354	7,599	962,042
1949 (Mid year) ..	761,962	119,623	70,749	10,923	9,716	7,845	980,818
1950 (Mid year) ..	789,160	123,624	72,467	11,504	10,093	8,605	1,015,453
1951 (Mid year) ..	806,690	127,063	75,601	12,785	10,451	9,343	1,041,933

Thus there has been a remarkable increase in Singapore's population over the last twenty years. In the twenty-year period from 1911 to 1931 the increase was some 83 per cent when the cause was mainly large scale immigration from India and China. Since 1931 the overall increase is about 87 per cent due to a steady increase by natural (births over deaths) means. Since the last war in fact the increase has been vitiated by the balance of emigration over immigration. In 1931 the number of females to males was 584 to 1,000. The ratio is now 862 to 1,000. This is the factor of real significance in present and future local population trends.

NOTE ON THE COCOS-KEELING AND CHRISTMAS ISLANDS

1951 POPULATION

COCOS-KEELING ISLANDS

1951 (Mid-year)		
Chinese	...	18
Malaysians	...	1,178
Indians and Pakistanis	...	3
Europeans	...	18
Eurasians	...	—
Others	...	—
Total	...	1,217

A reduction of 273 over the last 12 months.

CHRISTMAS ISLAND

1951 (Mid-year)		
Chinese	...	1,138
Malaysians	...	303
Indians and Pakistanis	...	4
Europeans	...	77
Eurasians	...	—
Others	...	—
Total	...	1,522

An increase of 50 over the last 12 months.

BIRTHS AND DEATHS, 1951

COCOS-KEELING ISLANDS

	Males	Females
Births	40	32
Deaths	5	7

CHRISTMAS ISLAND

	Males	Females
Births	48	28
Deaths	6	6

COLONY OF SINGAPORE

BIRTHS AND BIRTH RATES

			1931		1947		1951	
			Number	Rate	Number	Rate	Number	Rate
Chinese	...	...	15,993	37.85	33,629	46.20	37,155	46.06
Malays	...	...	2,862	43.69	5,473	47.73	6,062	47.71
Indians	...	...	1,020	19.64	3,087	43.30	3,425	45.30
Europeans	...	...	169	20.55	312	35.79	690	53.97
Eurasians	...	...	199	28.53	359	39.84	382	36.55
Others	...	...	227	29.09	185	28.27	402	43.03
Total			20,470	36.37	43,045	45.89	48,116	46.17
Male	...	...	10,753	—	22,152	—	24,751	—
Female	...	...	9,717	—	20,893	—	23,365	—
Total			20,470	—	43,045	—	48,116	—
Male births per 100 births			52.04		51.23		51.44	

BIRTHS BY SEX AND RACE, 1951

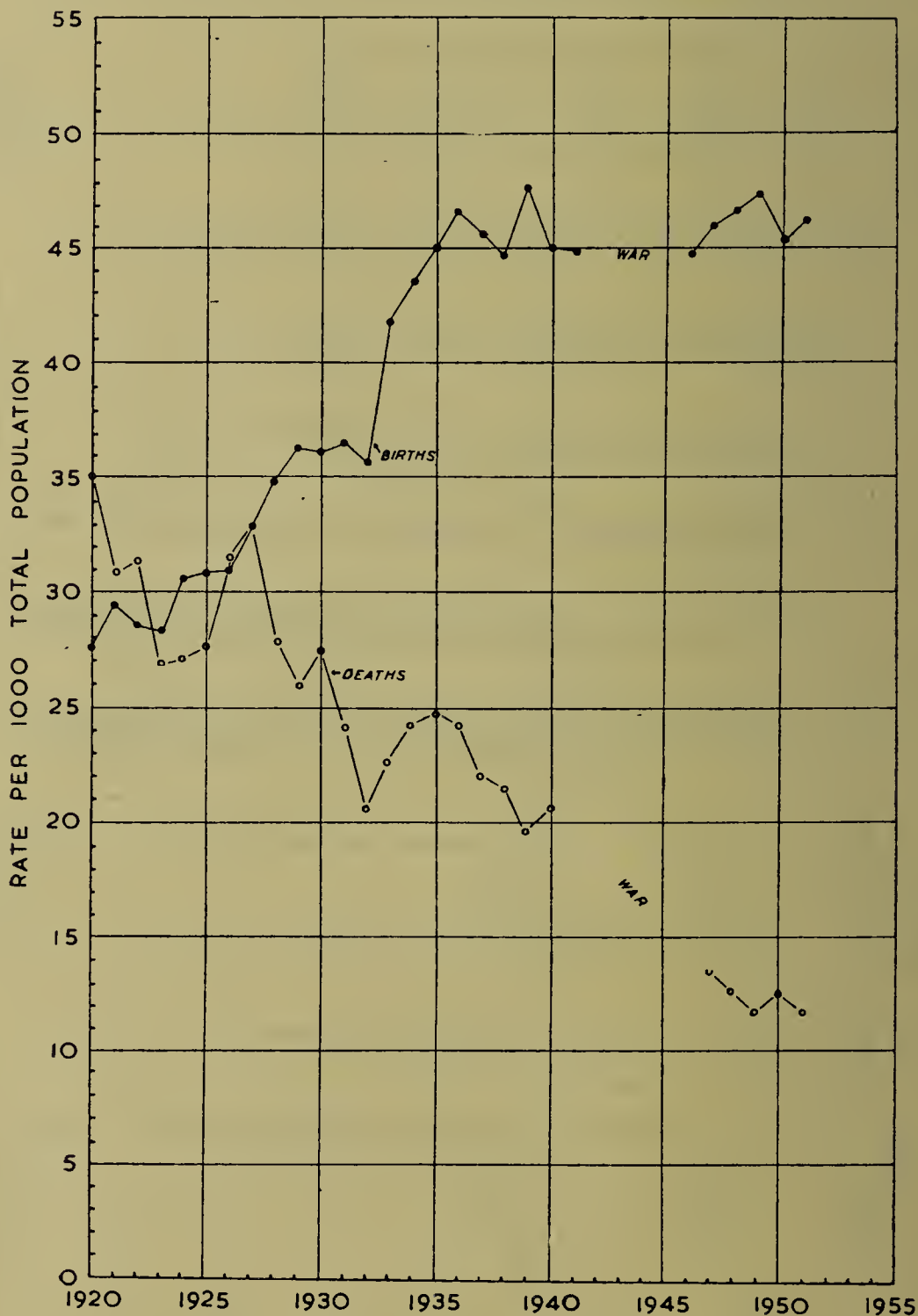
				Urban Area	Rural Area	Singapore Total
<i>Males</i>						
Europeans	...	...	...	116	235	351
Eurasians	...	...	...	183	24	207
Chinese	...	...	...	14,205	4,895	19,100
Malays	...	...	...	1,812	1,330	3,142
Indians	...	...	...	1,338	386	1,724
Others	...	...	...	156	71	227
Total				17,810	6,941	24,751
<i>Females</i>						
Europeans	...	...	...	115	224	339
Eurasians	...	...	...	159	16	175
Chinese	...	...	...	13,498	4,557	18,055
Malays	...	...	...	1,717	1,203	2,920
Indians	...	...	...	1,347	354	1,701
Others	...	...	...	133	41	174
Unknown	...	...	...	—	1	1
Total				16,969	6,396	23,365
Grand Total				34,779	13,337	48,116

Mother's Age	EUROPEANS		EURASIANS		CHINESE		MALAYS		INDIANS		OTHERS		TOTAL	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
13 years	..	..	..	..	..	2	1	..	1	..	..	..	1	1
14 years	..	..	..	..	..	6	9	7	4	..	..	..	12	13
15 years	..	..	..	..	8	52	70	60	19	..	..	..	94	85
16 years	..	..	1	..	133	44	125	112	40	..	..	..	219	203
17 years	..	1	4	1	286	127	163	144	48	..	1	3	351	328
18 years	..	1	5	5	549	322	227	220	99	..	4	6	621	636
19 years	..	4	7	9	800	532	160	148	102	..	18	12	837	787
20 years	6	8	10	10	1,035	822	259	245	130	..	16	16	1,221	1,227
21 years	19	20	13	7	1,126	974	186	185	124	..	17	13	1,394	1,321
22 years	18	18	14	9	1,255	1,091	208	189	142	..	15	7	1,523	1,436
23 years	27	24	14	14	1,176	1,148	169	183	123	..	17	12	1,605	1,519
24 years	18	15	14	21	1,093	1,093	131	155	90	..	14	7	1,443	1,392
25 years	21	27	13	5	1,063	978	216	212	119	..	13	8	1,445	1,335
26 years	26	25	13	11	930	876	139	121	83	..	13	10	1,204	1,130
27 years	27	28	10	11	1,026	947	169	139	86	..	11	11	1,329	1,226
28 years	24	25	13	9	996	907	165	155	100	..	14	11	1,312	1,223
29 years	29	29	11	6	833	807	95	77	60	..	13	4	1,041	965
30 years	22	26	15	5	883	882	157	131	88	..	17	10	1,182	1,138
31 years	20	19	3	7	784	712	65	69	50	..	6	5	928	864
32 years	13	16	10	8	763	749	67	77	44	..	3	9	900	920
33 years	14	15	9	6	732	708	69	74	42	..	10	4	876	841
34 years	11	5	8	3	637	619	27	23	28	..	2	7	713	682
35 years	16	2	7	6	685	610	67	53	35	..	6	7	816	705
36 years	8	7	2	6	592	586	28	24	21	..	3	4	654	642
37 years	10	7	..	3	581	537	46	31	11	..	3	5	651	601
38 years	6	3	6	5	590	503	47	31	17	..	3	1	669	566
39 years	8	8	..	3	439	417	19	16	7	..	1	1	474	455
40 years	3	1	2	2	378	340	26	14	4	..	3	..	416	366
41 years	2	3	..	..	285	223	13	6	4	..	..	..	306	236
42 years	..	1	..	1	188	188	5	9	4	..	..	..	197	201
43 years	..	1	..	1	115	126	9	6	2	..	..	..	126	134
44 years	..	..	..	..	882	70	1	..	1	..	1	1	86	72
45 years	..	..	1	1	63	55	1	..	1	..	..	..	66	59
Over 45 years	1	..	..	..	35	53	3	1	..	..	..	1	39	55
Total	351	339	207	175	19,100	18,055	3,142	2,920	1,724	1,701	227	175*	24,751	23,365*

*Includes one age unknown.

SINGAPORE
TREND OF CRUDE BIRTH AND DEATH RATES: 1920 ONWARDS.

(Rates are the number of births reported per 1,000 total population:
Rates are the number of deaths reported per 1,000 total population)



DEPT. OF SOCIAL MEDICINE & PUBLIC HEALTH

Fig. 1

The annual increase in the number of births over the post-war period received a check in 1950 in that the 1950 figure of 46,371 barely passed the 1949 figure of 46,169. This resulted in a reduction in the 1949 rate of 47.07 per 1,000 of the population to 45.67. The numbers and rate have turned to the upgrade again with 48,116 recorded births in 1951 and a rate of 46.17.

The crude birth rate does not give a satisfactory index of the reproductive capacities of the various races. The comparative figures should be based on the number of women in the child-bearing ages of 15—44 years, calculated on the age structure of females in the 1947 Census (the error would be hardly significant). Taking 100 as the standard for all races the rates are as follows:—

Chinese	...	...	...	...	93.8
Malays	...	...	...	...	100.5
Indians	...	...	...	...	151.7

Amongst the Chinese, however, there are many women employed in manual labour and domestic employment who suffer from what may be described as 'occupational continence', so that the birth rate amongst the Chinese women who bear children may well be higher than the figure of 93.8.

DEATHS AND DEATH RATES

			1931		1947		1951	
			Number	Rate	Number	Rate	Number	Rate
Chinese	...	...	10,599	25.09	9,368	12.87	9,288	11.51
Malays	...	...	1,905	29.08	2,029	17.70	2,055	16.17
Indians	...	...	820	15.81	878	12.32	771	10.19
Europeans	...	...	51	6.20	74	8.49	94	7.35
Eurasians	...	...	103	14.76	84	9.32	72	6.89
Others	...	...	145	18.58	78	11.92	101	10.81
Total	...	...	13,623	24.20	12,511	13.34	12,381	11.88

DEATHS BY SEX AND RACE, 1951

			Urban Area	Rural Area	Singapore Total
<i>Males</i>					
Europeans	...	...	40	32	72
Eurasians	...	...	32	3	35
Chinese	...	...	4,309	1,081	5,390
Malays	...	...	643	451	1,094
Indians	...	...	439	68	507
Others	...	...	48	13	61
Unknown	...	...	9	—	9
Total	...	...	5,520	1,648	7,168
<i>Females</i>					
Europeans	...	...	17	5	22
Eurasians	...	...	32	5	37
Chinese	...	...	3,156	742	3,898
Malays	...	...	555	406	961
Indians	...	...	211	53	264
Others	...	...	23	4	27
Unknown	...	...	3	—	3
Unknown Race and Sex	...	...	1	—	1
Total	...	...	3,998	1,215	5,213
Grand Total	...	...	9,518	2,863	12,381

SINGAPORE DIAGRAM TO SHOW TOTAL BIRTHS & DEATHS FOR PERIOD 1940 - 1951.

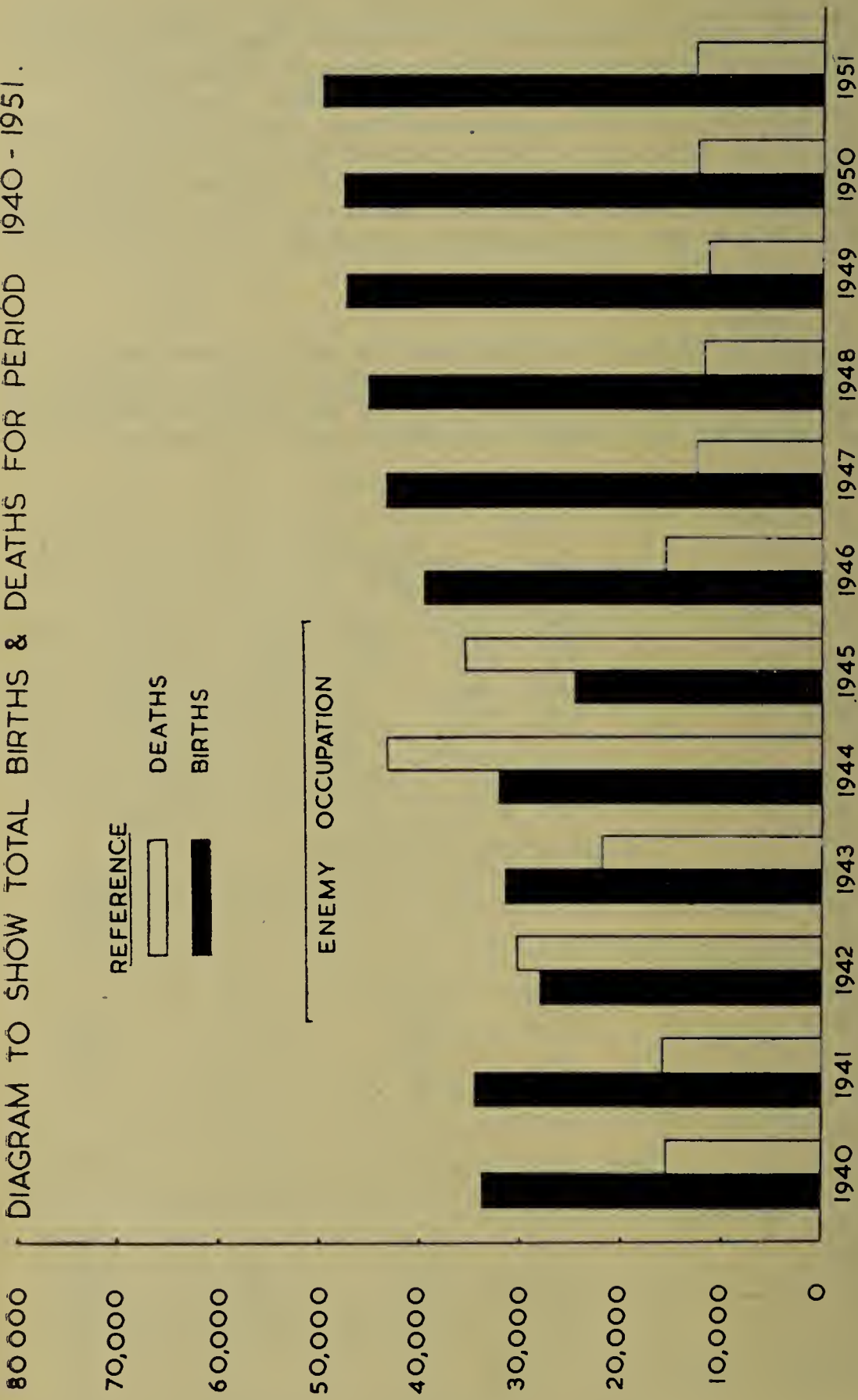


Fig. 2

DEATHS BY AGE GROUPS, 1951

Age		Urban Area	Rural Area	Total
0 — 1 day	... ..	372	107	479
1 — 7 days	... ..	297	114	411
8 — 14 days	... ..	172	47	219
15 — 21 days	... ..	159	28	187
22 — 28 days	... ..	91	16	107
NEO-NATAL DEATHS	... ..	1,091	312	1,403
1 — 2 months	... ..	333	159	492
2 — 3 months	... ..	309	105	414
3 — 4 months	... ..	158	26	184
4 — 5 months	... ..	126	51	177
5 — 6 months	... ..	117	34	151
6 — 7 months	... ..	117	32	149
7 — 8 months	... ..	117	28	145
8 — 9 months	... ..	105	37	142
9 — 10 months	... ..	97	29	126
10 — 11 months	... ..	84	38	122
11 — 12 months	... ..	90	21	111
INFANTILE MORTALITY	... ..	2,744	872	3,616
1 — 5 years	... ..	1,336	495	1,831
5 — 10 years	... ..	205	103	308
10 — 15 years	... ..	89	23	112
15 — 20 years	... ..	157	39	196
20 — 25 years	... ..	218	73	291
25 — 30 years	... ..	218	55	273
30 — 35 years	... ..	324	63	387
35 — 40 years	... ..	389	79	468
40 — 45 years	... ..	462	117	579
45 — 50 years	... ..	580	119	699
50 — 55 years	... ..	575	119	694
55 years and over	... ..	2,208	706	2,914
Age Unknown	... ..	13*	—	13*
Grand Total	... ..	9,518*	2,863	12,381*

* Includes one unknown sex and race.

DEATHS GROUPED ACCORDING TO AGE, SEX AND RACE, 1951

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
0 — 1 day ..	{ M. F.	4 1	3 ..	199 119	60 38	30 13	4 2	4 2	304 175
1 — 7 days ..	{ M. F.	2 1	2 2	176 106	54 29	18 13	7 ..	1 ..	260 151
8 — 14 days ..	{ M. F.	1 ..	1 ..	95 74	18 14	6 8	1 1	.. ..	122 97
15 — 21 days ..	{ M. F.	.. ..	.. ..	58 80	15 19	6 7	.. 2	.. ..	79 108
22 — 28 days ..	{ M. F.	.. ..	.. ..	33 49	11 7	4 3	.. ..	.. ..	48 59
Neo-Natal Deaths ..	M.&F.	9	8	989	265	108	17	7	1,403
28 days — 2 months ..	{ M. F.	.. ..	.. 1	166 174	74 46	16 13	1 1	.. ..	257 235
2 — 3 months ..	{ M. F.	2 1	1 ..	142 116	64 53	22 10	3 ..	.. ..	234 180
3 — 4 months ..	{ M. F.	.. ..	.. 1	58 61	31 17	7 6	1 2	.. ..	97 87
4 — 5 months ..	{ M. F.	2 ..	.. ..	62 42	30 27	4 9	1 ..	.. ..	99 78
5 — 6 months ..	{ M. F.	.. ..	.. ..	55 48	22 16	7 2	1 ..	.. ..	85 66
6 — 7 months ..	{ M. F.	.. ..	.. 1	48 52	18 22	4 4	.. ..	.. ..	70 79
7 — 8 months ..	{ M. F.	.. ..	.. ..	50 38	29 19	5 4	.. ..	.. ..	84 61
8 — 9 months ..	{ M. F.	1 ..	.. ..	59 47	18 8	5 4	.. ..	.. ..	83 59
9 — 10 months ..	{ M. F.	.. ..	.. ..	54 49	11 10	1 ..	.. 1	.. ..	66 60
10 — 11 months ..	{ M. F.	.. 1	.. 1	41 40	16 15	2 5	.. 1	.. ..	59 63
11 — 12 months ..	{ M. F.	.. ..	.. 1	53 32	7 13	2 2	1 ..	.. ..	63 48
Infantile Mortality ..	{ M. F.	12 4	7 7	1,349 1,127	478 353	139 103	20 10	5 2	2,010 1,606
Carried forward ..	M. & F.	16	14	2,476	831	242	30	7	3,616

DEATHS GROUPED ACCORDING TO AGE, SEX AND RACE, 1951—*continued*

Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Unknown	Total
<i>Brought forward</i> ..	{ M. F.	12 4	7 7	1,349 1,127	478 353	139 103	20 10	5 2	2,010 1,606
1 year — 5 years..	{ M. F.	1 1	1 3	711 683	171 179	36 41	1 3	.. ..	921 910
5 years — 10 years..	{ M. F.	1 ..	1 ..	135 109	32 19	2 7	2 ..	.. ..	173 135
10 years — 15 years..	{ M. F.	.. ..	.. ..	50 39	6 11	3 3	.. ..	.. ..	59 53
15 years — 20 years..	{ M. F.	5 ..	.. ..	85 49	14 30	1 9	3 ..	.. ..	108 88
20 years — 25 years..	{ M. F.	6 1	.. 1	100 79	29 46	11 16	1 1	.. ..	147 144
25 years — 30 years..	{ M. F.	5 1	3 1	105 75	19 33	19 7	4 1	.. ..	155 118
30 years — 35 years..	{ M. F.	3 3	1 1	164 102	32 33	35 10	2 1	.. ..	237 150
35 years — 40 years..	{ M. F.	2 ..	2 ..	229 136	30 27	33 9	.. ..	.. ..	296 172
40 years — 45 years..	{ M. F.	3 ..	1 1	288 145	43 31	55 8	2 2	.. ..	392 187
45 years — 50 years..	{ M. F.	9 1	1 1	383 175	45 27	48 6	3 ..	.. ..	489 210
50 years — 55 years..	{ M. F.	6 1	5 ..	389 160	47 27	45 12	1 1	.. ..	493 201
55 years and over ..	{ M. F.	19 10	13 22	1,393 1,019	148 145	80 33	23 8	.. 1	1,676 1,238
Age Unknown ..	{ M. F.	.. ..	.. ..	9 ..	.. ..	.. ..	.. ..	3 ..	12 ..
Total ..	{ M. F.	72 22	35 37	5,390 3,898	1,094 961	507 264	61 27	9 3	1,168 5,212*
Grand Total ..	M. & F.	94	72	9,288	2,055	771	88	13*	12,381*

*Includes one unknown sex and race.

As the death rate for 1949 was the lowest on record at 11.84 per 1,000 of the population, the 1951 figure of 11.88 can be said to equal it after a rise to 12.12 in 1950. The latest England and Wales rate available is that of 1949 of 11.8. While there has only been an increase in deaths from circulatory and genito-urinary diseases as compared with 1950, every condition shows a marked improvement on pre-war figures except deaths from circulatory disease and non-pulmonary tuberculosis. Deaths from the latter cause are

comparatively few however. The decline in deaths from pulmonary tuberculosis continued to below half the pre-war at 1,096 per million. Other conditions which have shown a remarkable decline as compared with the pre-war are malaria and unspecified fever at 45 per cent: beri-beri at 28 per cent: bronchitis and pneumonia some 60 per cent: diseases of early pregnancy and early childhood at 62 per cent: infantile convulsions at 56 per cent: influenza and acute rheumatism at 17 per cent: typhoid, dysentery and diarrhoea at 63 per cent. The general health of the Colony can be classed as remarkably good at present.

INFANT MORTALITY

Race	1931		1947		1951	
	Number	Rate	Number	Rate	Number	Rate
Chinese	3,041	183.83	2,671	79.43	2,478	66.69
Malays	722	261.35	784	143.25	829	136.75
Indians	171	163.73	236	76.45	242	70.66
Europeans	5	29.59	18	57.69	16	23.19
Eurasians	23	110.55	28	77.99	14	36.65
Others	34	149.78	21	113.51	37	92.04
Total ...	3,996	191.30	3,758	87.33	3,616	75.15

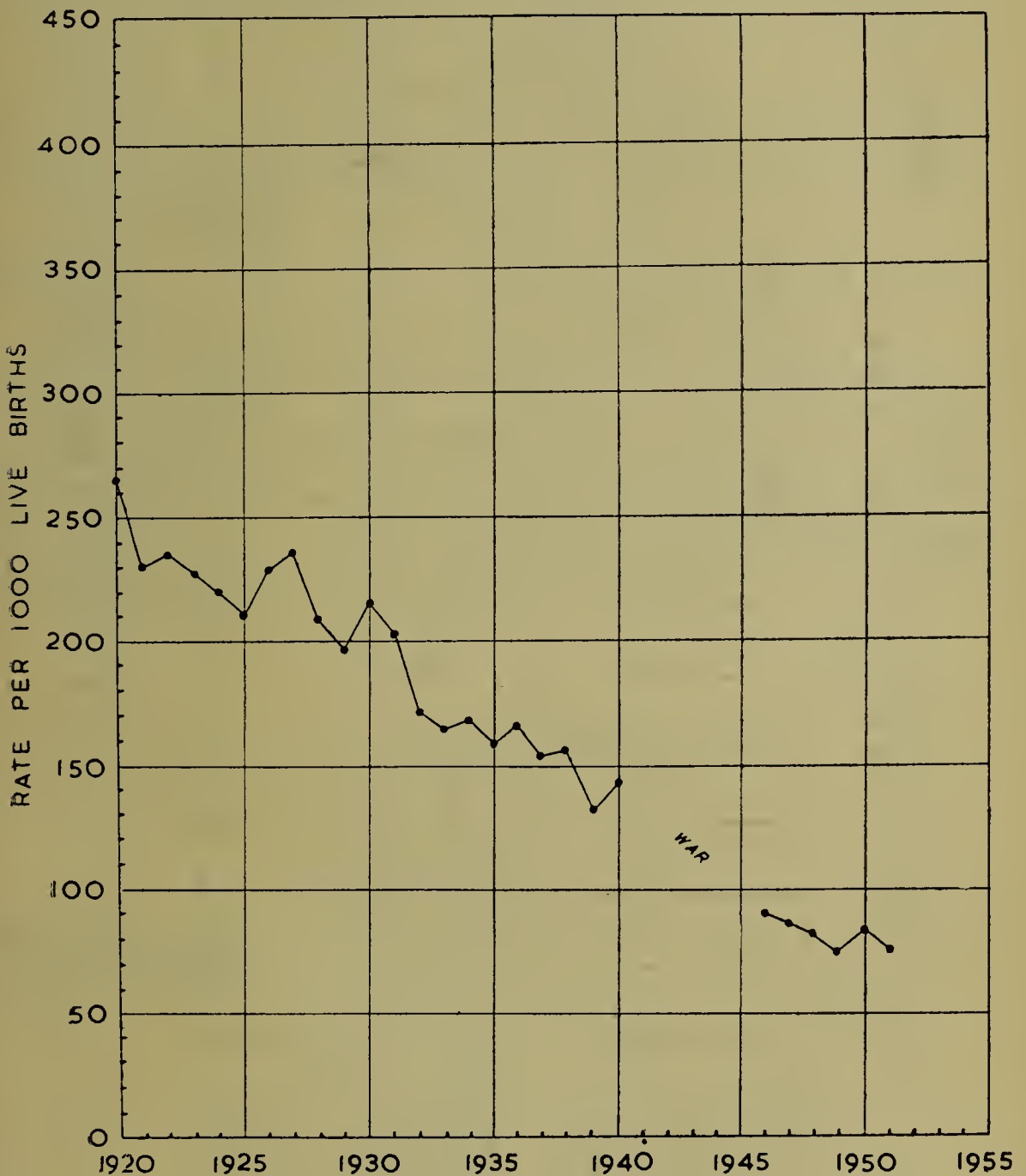
			URBAN AREA		RURAL AREA		SINGAPORE		Rate per mille of births
			Births	Deaths under one year	Births	Deaths under one year	Births	Deaths under one year	
FIRST QUARTER			8,048	616	3,103	180	11,151	796	71.37
January	..	..					
February	..	..					
March	8,829	649	3,354	218	12,183	867	71.16
SECOND QUARTER									
April	..	..					
May	8,662	818	3,424	264	12,086	1,082	89.53
June	..	..					
THIRD QUARTER									
July	9,240	661	3,456	210	12,696	871	68.60
August	..	..					
September	..	..					
FOURTH QUARTER			9,240	661	3,456	210	12,696	871	68.60
October	..	..					
November	..	..					
December	9,240	661	3,456	210	12,696	871	68.60
FOURTH QUARTER									
October	..	..					
November	9,240	661	3,456	210	12,696	871	68.60
December	..	..					
FOURTH QUARTER									
Total ..			34,779	2,744	13,337	872	48,116	3,616	75.15

Rate per mille of births for 1951 = 75.15.

SINGAPORE

TREND OF INFANT MORTALITY RATES: 1920 ONWARDS

(Rates are the number of deaths reported under one year of age per 1,000 live births).



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Fig. 3

SINGAPORE

INFANT MORTALITY RATES BY RACE: 1931 ONWARDS

(Rates are the number of deaths reported under one year of age per 1,000 live births)

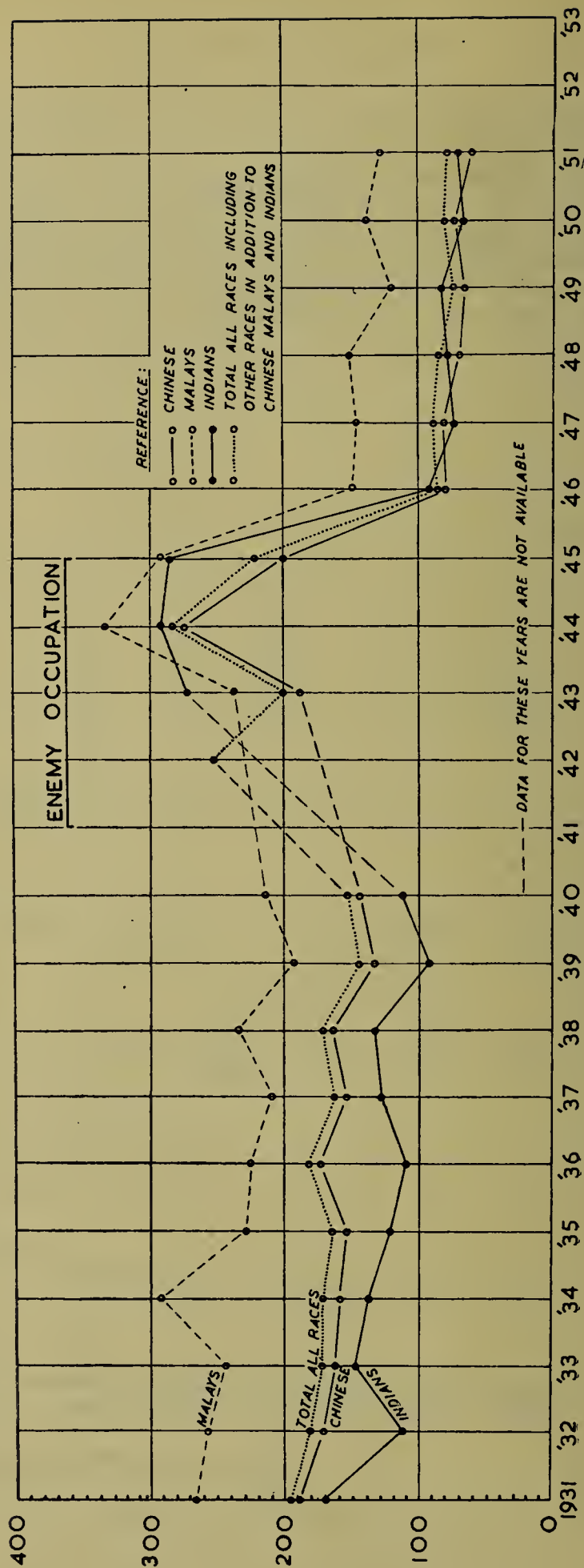


Fig. 4

The low record of 72.04 infant deaths under one year of age per 1,000 live births (the Infant Mortality Rate) recorded for 1949 was again approached in 1951 at 75.15. This compared very favourably with any previous year except 1949 and particularly with the war and pre-war periods (285.0 in 1944 and 130.43 in 1939).

The record Indian rate of 67.56 in 1950 was not quite maintained at 70.66. The Chinese rate (the most important) recorded a low of 66.69. The Malay rate continued to be high but the figure of 136.75 shows a welcome renewal of the downward trend again and is by far the best record apart from 1949.

While the present infant mortality rate is an improvement on the 1920 era in England and Wales (1916-1920=90.90) it has a long way to go to the latest figure in that country of 32.4. A reduction to the 40 range is confidently envisaged when the Medical Plan in regard to infant and maternity services is in operation.

Of the 3,616 infant deaths registered in Singapore during the year 1951, 2,010 were of males and 1,606 were of females, there being one of undetermined sex.

Still births accounted for 16.3 per 1,000 of all births as compared with 17.4 in 1951. This figure compares favourably with the 1949 England and Wales figure of 22.7.

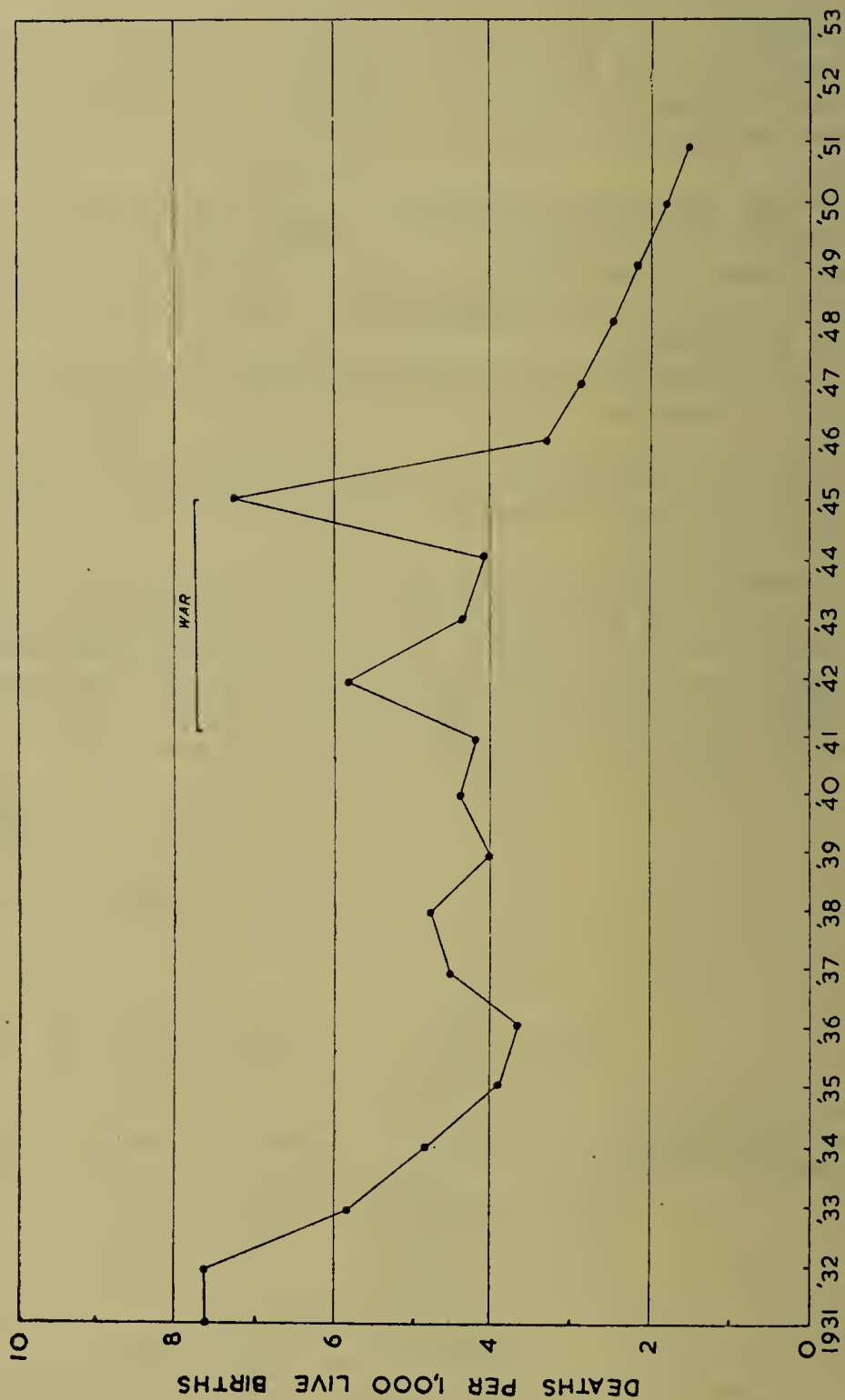
The important neo-natal mortality rate was 29.2 per 1,000 live births compared with 29.8 in 1950 and 28.0 in 1949. The hesitancy over a continuing drop, however, shows the necessity for the Medical Plan. The England and Wales figure was 19.3 for 1949. The high figures for the first three months of life indicate the unsatisfactory feeding of the new born which is still such an unsatisfactory feature in the social life of Singapore.

		SINGAPORE		ENGLAND AND WALES
		1950	1951	1949
Singapore infant mortality rate (deaths under 1 year per 1,000 related births)	under 4 weeks ...	29.8	29.2	19.3
	1 to 3 months ...	22.3	18.9	4.8
	3 to 6 months ...	10.7	10.6	4.4
	6 to 9 months ...	11.0	9.2	2.4
	9 to 12 months ...	8.3	7.4	1.4
Rate ...		82.2	75.2	32.4

MATERNAL MORTALITY

The maternal mortality rate continued to decline and reached a record of 1.6 per 1,000 total births as compared with 1.9 in 1950, over 7.0 in 1945 and 4.0 in 1939. The corresponding figure for England and Wales in 1949 was 0.8.

SINGAPORE TREND OF MATERNAL MORTALITY RATES: 1931 ONWARDS. (Rates are the number of deaths reported from puerperal causes per 1000 live births).



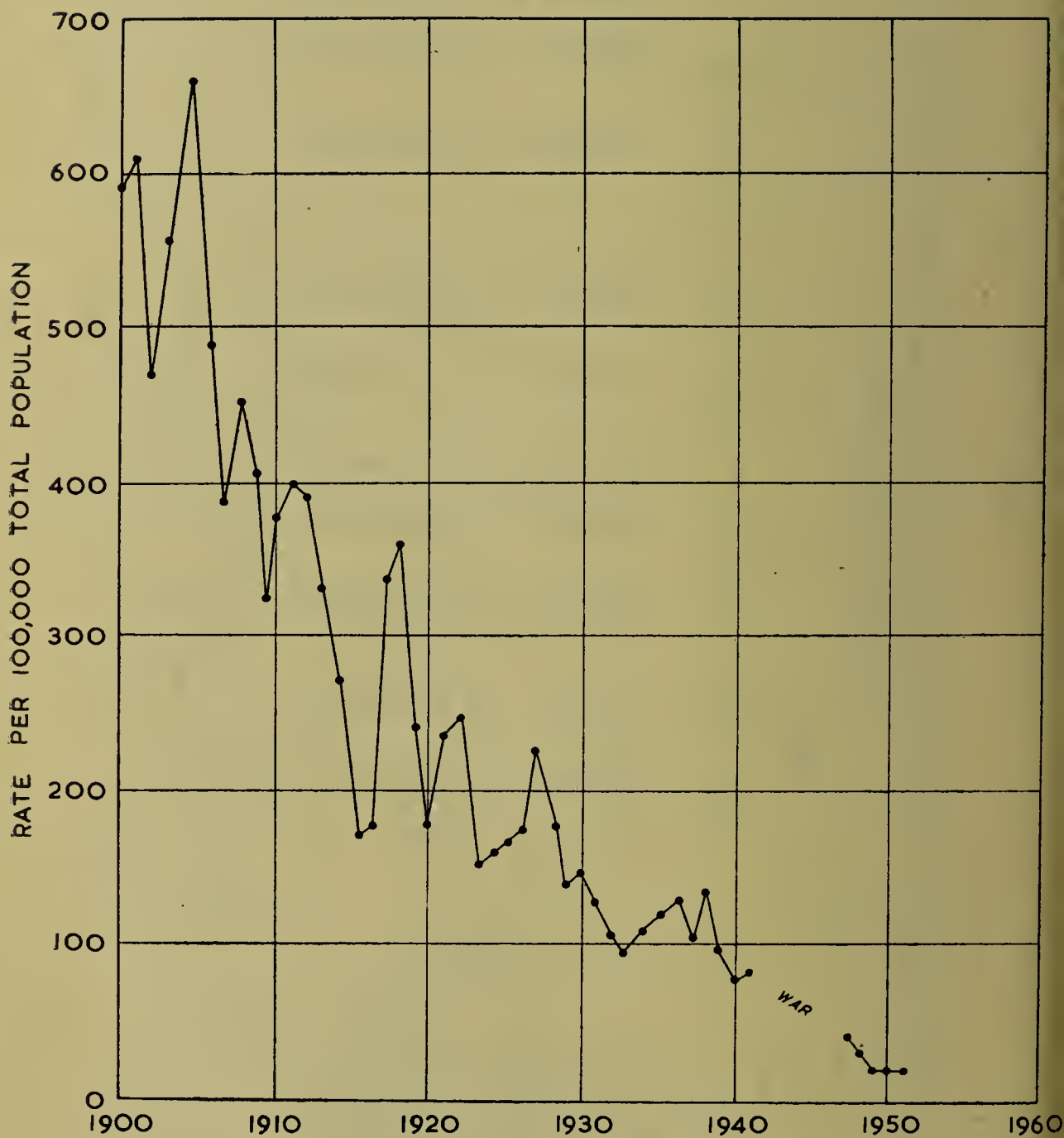
TOTAL NUMBER OF DEATHS, RATE PER MILLION OF POPULATION AND COMPARISON WITH THE AVERAGE RATE FOR 1939/1941
BY PRINCIPAL CAUSES OF DEATHS

Causes	AVERAGE 1939/1941			1948			1949			1950			1951		
	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index	No. of deaths	Rate per million	Index
Malaria and Unspecified Fever	1,159	1,547	65	971	999	65	838	854	55	819	806	52	730	701	45
Violence (all forms)	477	637	74	457	470	74	443	452	71	494	486	76	463	444	70
Beri-Beri	654	873	37	312	321	37	235	240	27	246	242	28	256	246	28
Senility	927	1,237	76	920	946	76	897	915	74	1,033	1,017	82	1,027	986	80
Pulmonary Tuberculosis	1,714	2,288	65	1,449	1,491	65	1,290	1,315	57	1,211	1,193	52	1,052	1,096	48
Heart Disease	491	655	68	433	445	68	452	461	70	567	558	85	628	603	92
Diseases of the circulatory system	168	224	79	173	178	79	197	201	90	204	201	90	239	229	102
Diseases of Pregnancy, Childbirth and the puerperal state	145	192	58	108	112	58	102	104	54	86	85	44	80	77	40
Premature births and diseases of early infancy	849	1,135	82	896	931	82	723	737	65	812	800	70	777	746	66
Infantile Convulsions	1,793	2,393	54	1,257	1,293	54	1,306	1,332	56	1,364	1,343	56	1,399	1,342	56
Diseases of the respiratory system excluding Tuberculosis	2,216	2,958	62	1,775	1,845	62	1,879	1,916	65	2,034	2,003	68	2,122	2,037	69
Typhoid, Dysentery, Diarrhoea and Enteritis	1,350	1,802	61	1,064	1,094	61	1,039	1,059	59	1,185	1,167	65	1,184	1,136	63
Other diseases of the digestive system	409	546	64	340	350	64	364	371	68	429	422	77	433	416	76
Tuberculosis other than respiratory system	186	248	97	233	240	97	270	275	111	266	262	106	247	237	96
Diseases of the genito-urinary system	548	731	40	285	293	40	279	284	39	242	238	33	331	318	44
Diseases of the nervous system	438	585	312	303	312	53	349	356	61	320	315	54	297	285	49
Influenza, acute rheumatism	279	372	101	101	104	28	103	105	28	86	85	23	67	64	17
Cancer	353	471	73	334	344	73	296	302	64	340	335	71	356	342	73
Others	1,147	1,531	35	522	537	35	559	570	37	574	565	37	693	665	44
Total	15,302	20,425	60	11,933	12,275	60	11,621	11,848	58	12,312	12,125	59	12,381	11,883	58

Indices are based on 1939/1941 average rate per million of population.

SINGAPORE
TREND OF BERI-BERI DEATH RATES: 1900 ONWARDS.

(Rates are the number of deaths reported from beri-beri
per 100,000 total population)



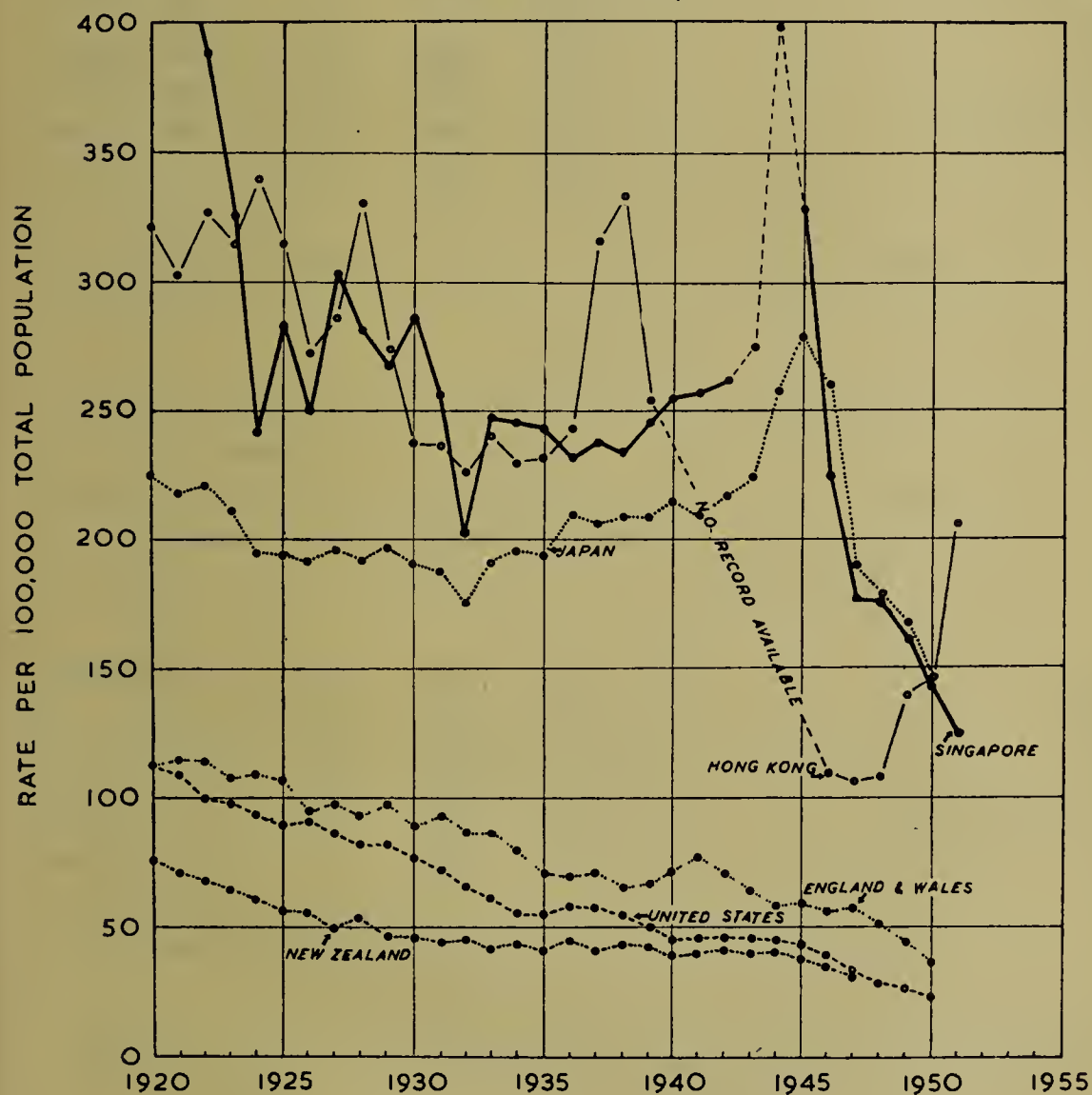
DEPT. OF. SOCIAL MEDICINE & PUBLIC HEALTH.

Fig. 6

TREND OF TUBERCULOSIS DEATH RATES: 1920 ONWARDS

(Singapore and certain other countries)

(Rates are the number of deaths reported from tuberculosis (all forms) per 100,000 total population).



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Fig. 7

MIGRATION STATISTICS BY SEA AND AIR DURING 1951

IMMIGRANTS

Race				ADULTS		CHILDREN		Total
				Male	Female	Male	Female	
European	...	...	...	18,394	7,502	1,501	915	28,312
Eurasian	...	...	...	117	83	41	32	273
Chinese	...	..	...	29,133	6,991	2,466	1,611	40,201
Malaysian	...	...	...	3,342	842	254	242	4,680
Indian and Pakistani	...	...	...	15,417	1,833	766	593	18,609
Others	...	...	...	2,794	601	170	129	3,694
Total, All Races				69,197	17,852	5,198	3,522	95,769

EMIGRANTS

Race				ADULTS		CHILDREN		Total
				Male	Female	Male	Female	
European	...	...	...	18,585	7,480	1,441	883	28,389
Eurasian	...	...	...	71	47	20	8	146
Chinese	...	...	...	46,597	10,556	5,214	3,539	65,906
Malaysian	...	...	...	5,323	1,611	530	538	8,002
Indian and Pakistani	...	...	...	15,587	1,811	871	671	18,940
Others	...	...	...	2,324	685	273	201	3,483
Total, All Races				88,487	22,190	8,349	5,840	124,866

CHINESE DECK PASSENGERS FROM AND TO CHINA AND HONGKONG, 1951

Country		IMMIGRANTS					EMIGRANTS				
		ADULTS		CHILDREN		Total	ADULTS		CHILDREN		Total
		Male	Female	Male	Female		Male	Female	Male	Female	
China	..	5,620	1,627	959	598	8,804	11,603	2,591	1,778	1,602	17,574
Hong Kong	..	4,712	1,468	547	414	7,141	7,446	2,234	1,784	842	12,306
Total	..	10,332	3,095	1,506	1,012	15,945	19,049	4,825	3,562	2,444	29,880

PART II

THE HEALTH DIVISION

CHAPTER SEVEN

INTRODUCTION

IN Singapore, as elsewhere, an efficient organisation for the prevention of disease and the promotion of health is regarded as an essential measure both for the safeguarding of the public and for the creation of a more satisfying order of society. The administration of this work and its extension into rural districts beyond the City boundaries is the duty of the Health Branch of the Government Medical Department. This duty has been fulfilled in spite of numerous difficulties, and to-day, in addition to the Air and Port Health Quarantine Service, the School Medical and Dental Service, the activities of which are extending to all schools in the Colony, and some minor obligations in relation to Crown lands and Crown property within the City limits, the Government is responsible for all health measures in Rural Singapore, which with the smaller islands included within its jurisdiction occupies an area of 193 square miles and harbours a population of approximately 300,000.

The continuing lack of adequate accommodation and staff, and responsibility for the executive functions of sanitation which should properly be the duty of a separate unit, tended to make 1951 a difficult year. Nevertheless the Colony continued to report a satisfactory state of health. The steady decline in infant mortality and general mortality continues. While the latter now corresponds as a figure with that of England and Wales, it cannot be compared directly because the age structure of the population here is such that the age groups which carry a greater risk of dying are smaller. Geriatrics, while beginning to raise a venerable head, is not the problem that it is in Europe and America. In the 1947 census the percentage of persons in the age groups 65 years and over was under two.

On the other hand there is the remarkable freedom from many major infectious diseases such as plague, cholera and small-pox, the absence of malaria except for cases arriving from without, the decline in many respiratory infections, and a similar improvement in the more lethal alimentary affections. While some of the reduction in the general mortality rate is artificial only when international comparisons are attempted, the improvement in housing even though we are far from being adequately housed, the prosperity within us in spite of the high cost of living, the comparatively higher standard of living, the advent of anti-biotics and sulpha drugs, the increased readiness of the people to take advantage of medical facilities, the not inconsiderable co-operative and helpful activities of Governmental, semi-Governmental and voluntary bodies, and the medical profession, and many other factors, all of which have been functioning continuously and with increasing effectiveness during the last five years, lend support to the view that the improvements noted are largely actual.

Nevertheless there is much room for improvement and none for complacency. There are indications that the limits of improvement have now been reached, and unless changes are made in the direction of modern methods of general sanitary control, keeping pace with the increasing population, a tendency to serious deterioration will develop in the next few years.

The Chief Health Officer is responsible on the one hand to the Director of Medical Services for all actual health services in the so-called 'Rural Area' of the Colony, for the School Medical and Dental Service, the B.C.G. vaccination campaign, and all sea and air Quarantine services; and on the other hand to the Chairman, Rural Board, for all other 'environmental'

services such as housing, drainage, sanitation, conservancy. This has a parallel with the Medical Officers of Health of the major local authorities in England and Wales where the M.O.H. has his loyalties divided between the Minister of Health for functions under Part III of the National Health Service Act and to the Minister of Local Government and Town Planning for environmental health services. Owing to the understanding and complete liaison that exist between the Director of Medical Services and the Rural Board, such divided responsibilities here have not tended to impede the normal work of the Government Health Division in any way.

The Chief Health Officer is a member of the Rural Board and advises the Board on matters of general policy. The Health Division is in control of all scavenging and conservancy services and employs the labour engaged in such Rural Board duties. All building plans are scrutinised by the rural health officers, who besides being responsible for these executive functions also carry out all necessary anti-malarial measures. Three travelling dispensaries and one floating dispensary seek to reach the population in the rural districts which cannot be met as yet by static institutions.

The Government Maternity and Child Welfare staff does all its work in the rural areas, while the School Medical and Dental section looks after the health of both urban and rural school children and advises on school buildings.

The staff engaged directly on Rural Board duties is as follows:—

Health Officers	...	...	...	...	2
Sanitary Inspectors	...	...	...	...	7
Technical Subordinates	...	...	...	...	37
Labourers: (a) Anti-malarial	...	...	...	...	408
(b) Scavenging	...	...	...	...	274
Drivers	...	...	...	...	7
(Paid from Rural Board Funds)					

The Maternity and Child Welfare service is staffed as follows:—

Lady Health Officers	...	...	...	...	2
Public Health Matrons	...	...	...	...	1
Health Sisters (including Supervisor of midwives)	...	...	...	...	5
Health Nurses	...	...	...	...	13
Health Midwives	...	...	...	...	26
Health Servants	...	...	...	...	21

In addition, six school health officers and eight health nurses with two hospital assistants of the schools branch and one schools sanitary inspector do much of the work in the Rural Board area. There is also a public dispensary with a hospital assistant in charge at Bukit Timah and another at Paya Lebar. Although this latter dispensary is actually in the City area, it draws a large number of its patients from the rural districts around. The School Dental Service, although a Singapore service, is as yet too small to reach the rural districts. A small school travelling dispensary operates under a nurse and a driver in addition to the above.

The work of the Port Health section has to be maintained both from the point of view of the protection of the Colony from dangerous infectious disease from outside and for reasons of international obligations. The same statement also applies to work at the Airport, but here our difficulties are complicated by an ever-increasing tempo in air services which demand more personnel to keep control functioning satisfactorily.

The Maternity and Child Welfare section is keeping pace with the demands made upon it at the expense of a greatly overworked staff. There is a grave tendency for new recruits to the service to resign after a short term when they discover the extremely hard work, with little respite, to which they are committed.

The Schools Division has not kept pace with the demands made on it and the reasons for this are given in the appropriate section of this report. Such neglect may not be immediately apparent but it will show in the health of the adult population in a few years' time.

The construction of two maternity and child welfare centres on up to date lines, with accommodation for staff, the one at Nee Soon to replace an existing main centre at present housed quite inadequately, and the other at Holland Village to establish a new one in an area previously served by clinics held by visiting nurses and midwives—was commenced in late 1951. These will be ready for occupation in mid 1952. The possibility of expanding these clinics to multi-purpose health centres has been kept in view and land is available for this purpose. Plans have now been finalised also for the erection of a centrally situated school and dental clinic which will afford ample facilities for a tuberculosis clinic with B.C.G. immunisation in addition. Parallel with these developments vacancies have been created, and some have been filled, to augment the staff. The lack of suitable applicants is causing some concern however.

In June, U.N.I.C.E.F./W.H.O. initiated a campaign of B.C.G. inoculation by sending an expert team headed by Dr. Arne-Buus Hansen. During a four months' period of operation this trained a number of local teams and carried out testing and inoculation on some 30,000 children and mothers. The Government then assumed responsibility for continuing the campaign which is proceeding satisfactorily. A scheme for the mass immunisation of the Singapore population against small-pox on a voluntary basis has also been completed and will be put into effect in the coming year as it is considered that the local population is becoming dangerously under-vaccinated. The lack of public response to the diphtheria immunisation which is available is causing concern. In consequence a public propaganda campaign is being developed with the co-operation of the Public Relations Office on a Colony-wide basis.

PUBLIC HEALTH CONFERENCE

Two meetings were held during the year under the chairmanship of the Director of Medical Services. These conferences are a post-war development arising from the period of the British Military Administration when all the health services of the Island of Singapore, both civil and military, were fully co-ordinated. Now all interested parties meet together in an effort to keep this co-ordination going. The members cover Civil Government, City, Navy, Army and Air Force and the World Health Organisation. Federation representatives attend as observers. Any subject affecting the health of the whole community can be raised. All local public health problems are kept under constant review by this means.

Chief Health Officer at the end of the year—Dr. M. Doraisingham, L.M.S. (Singapore): D.P.H. (London).

CHAPTER EIGHT

INFECTIOUS DISEASE IN RURAL SINGAPORE

FOR the fourth year in succession no case of small-pox, cholera or plague occurred in the Colony.

POLIOMYELITIS

81 cases of acute anterior poliomyelitis were reported during the year of which 31 occurred in the Rural Area. As it is of interest to review the situation with regard to poliomyelitis over the last few years, this particular problem is considered on a Colony basis.

Acute anterior poliomyelitis has been present in Malaya for many years but did not attract particular attention until the post-war decade. In 1934-5 there was a mild outbreak which roused only a passing interest. In the early part of 1941 four cases occurred in a school at Cameron Highlands, with one death, one mild paralysis and two complete recoveries. This caused a minor sensation and the disease was made notifiable for the first time. The presence of cases in Ipoh, Tapah, Kuala Lumpur and Singapore at the same time seems to have escaped attention.

In 1945-6 there was a sharp outbreak of poliomyelitis in Singapore particularly in the months of January to March. The incidence reached a high peak (33 cases) in the second week in February and then died away rapidly. Only two cases were reported during the remainder of 1946, one in June and the other in July. During this outbreak there was a total of 137 cases amongst the civilian population and a further 52 amongst service personnel. In the civilian population the cases were mostly young children, but the high incidence amongst adults in the Services was an unusual feature.

After the two sporadic cases in the Services in June and July no more were reported until 1948, when there was a sudden sharp outbreak in the months of April, May and June, with a peak of 58 cases in May. There was a subsequent rise to 20 cases in July and then the number reported fell away to between 2 and 10 cases per month for the rest of the year. This time the large majority of the cases were civilians residing in the City Area: the Services played a very minor part in the recrudescence. The outbreak did not die away completely, this time however, and for the rest of 1948 and throughout 1949 there was a steady rise and fall in the number of cases, varying from 2 to 12 per month.

In 1950 the incidence declined, and during the months of March, April and May no case was reported. After that the number again began to rise, and in October, November and December of that year there was another recrudescence of the disease with a peak of 40 cases in November. Again the outbreak was mainly amongst civilians in the urban area although the rural districts showed a small rise with a peak delayed until December. The Services showed a minor rise and the occurrence of four serious cases in one Officer's Mess on the Island of Pulau Brani within a fortnight showed how at times the infectious nature of poliomyelitis can be demonstrated.

The peculiar feature of the 1950 outbreak was the time at which it occurred. The two previous outbreaks occurred during the early part of the year, February 1946 and May 1948. In 1950, March, April and May were free from the disease and the outbreak occurred in October, November and December. Although it is difficult to make dogmatic statements about how

ANTERIOR POLIOMYELITIS IN SINGAPORE (1946-1952)

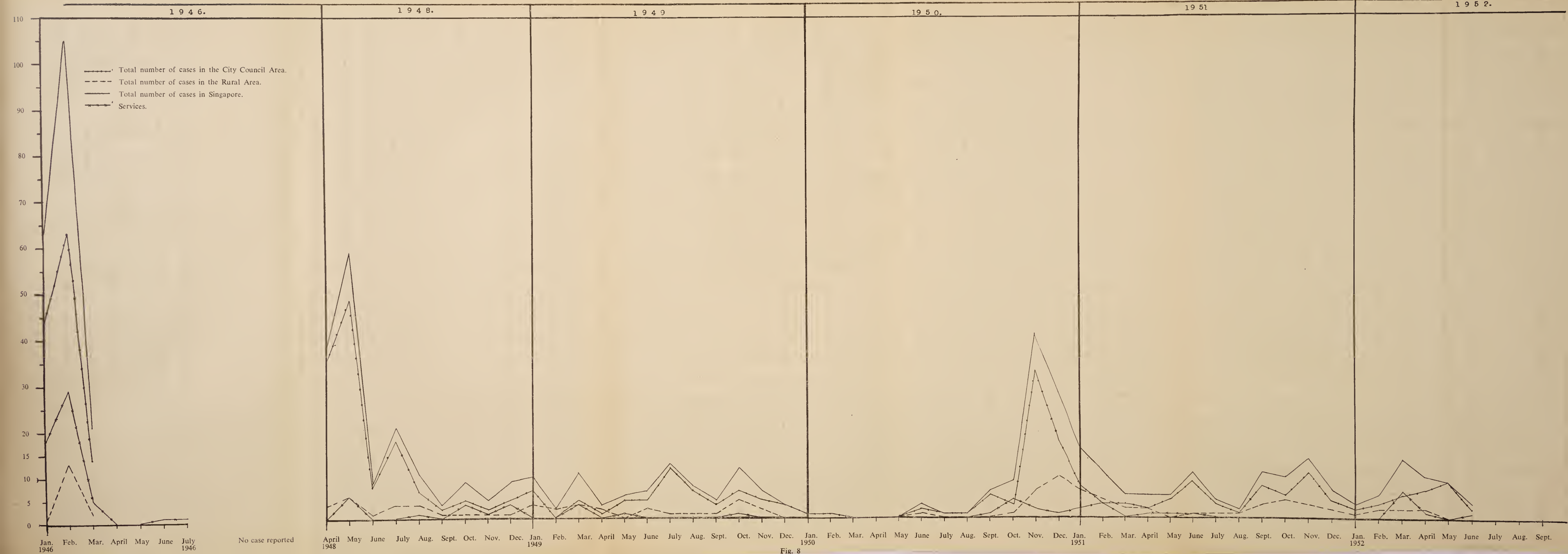


Fig. 8

poliomyelitis is spread, it is known that the virus occurs in the naso-pharynx and in the faeces. The disease may be spread by droplet infection from the noses of mild cases or possibly in the same manner as in any other bowel infection, by water, by contaminated food, by flies, by carriers. Overcrowding in houses or close contact in messes and barracks would favour the first method of spread, and general bad sanitation would favour the second method.

Respiratory spread would be favoured by overcrowding so that a greater number of cases per number of people would be expected in the City. This is found to be the case. According to the 1947 census figures the population of the urban area was 2.6 times as great as that in the rural area, and there is little reason to believe that this proportion has changed significantly since. During the years 1948–50 there were 63 cases of poliomyelitis in the rural areas, so that a population of 2.6 times as great might be expected to have had $63 \times 2.6 = 164$ cases, or because of the cumulative effect of densities in population, an even larger number of cases. In fact the number of cases in the city area was 239 over the period, a figure favouring the theory of respiratory spread. The special circumstances of each case would have to be examined with care before any definite conclusions could be arrived at, however.

In Malaya generally the sanitation is affected by the rainfall. In dry weather rubbish accumulates on the surface of the ground. Gentle rain makes this surface suitable for fly breeding and heavy rain washes it into earth-wells and water courses. Alimentary infection seems to follow the rainfall. A graph showing the incidence of cases of poliomyelitis in Singapore together with the rainfall and the humidity shows no relation between the climatic features and this incidence, at any rate in the monthly figures. Again, the Malayan house fly is attracted by household refuse and not by human faeces so that the infection of the house-fly is doubtful.

It had been thought that the outbreaks in the early parts of 1946 and 1948 were related to some climatic feature. The outbreak in the late autumn of 1950 contradicts this view, and no climatic feature can be discovered to account for this change in the time of the year or for the sudden rise in cases. So far as our present knowledge of the features mentioned goes, the change in seasonal incidence in 1950 cannot be explained.

One thing, however, is certain. The disease has become noticeably endemic and its total eradication must await a clearer appreciation of its methods of spread. A cyclical periodicity varying from 28 to 30 months is suggested by the graph for the period January 1946 to December 1951. The first recorded epidemic peak occurred in February 1946, and the second in May 1948, after a lapse of some 28 months. The third epidemic peak showed itself in November 1950, 30 months later. A further feature is that while there was not a single case notified from April 1946 to April 1948, the second recorded inter-epidemic period was distinguished by the occurrence of cases throughout except for the months of March, April and May 1950. The total absence of any case during the first inter-epidemic period would also suggest that the second epidemic might have arisen by the introduction of a different strain which has now established itself in the Colony. If this be the case it would be too premature to talk of cyclical periodicity since we may now be observing only the first phase of the new strain.

The post-war years have witnessed an important change in the age-structure of the population, which has now become very much younger. The fact that more than 60 per cent of polio cases occurred in children under the age of 10 years may partly explain the endemic state of the disease in the Colony.

DIPHTHERIA

A total number of 47 cases of diphtheria in 1949, and 49 cases in 1950, with a morbidity rate of about 0.2 per thousand of the population, occurred in the rural areas of Singapore. In 1951, however, this figure rose to 90 giving a morbidity rate of 0.3 per 1,000. In the Colony actually 374 cases occurred during the year with 101 deaths. The very high mortality is largely due to the fact that only in very few instances are children brought to hospital in the early stages of the disease. Further, the age incidence favours infants and children under three. While in the past diphtheria has been regarded as a disease of little importance in rural Singapore, the rapid increase in its incidence no longer justifies this complacency. Immunisation against diphtheria has been offered in the Rural Maternity and Child Welfare Clinics since 1948, but so far only about 25 per cent of the children born have been so protected. The lack of efficient health education amongst a people whose traditional ideas and beliefs are backed by age-old custom, is one of the main factors in the poor immunisation rate so far recorded. Various methods of more active propaganda are being devised, but it is doubtful to what extent we shall be able to break down prejudice and induce parents to bring their children to the clinics for this purpose for some time to come.

Both in the City and in the Rural Area overcrowding is intense. This is further aggravated by the habits of certain communities, particularly the Chinese, amongst whom there is a tendency to live in overcrowded bedrooms even when there is more ample accommodation. Moreover there is a far greater intimacy between adults and children amongst Asians. The cumulative effect of overcrowding is to increase the carrier rate in the population, and the greater intimacy between the adult and the child would certainly facilitate the transmission of the bacillus from the carrier to the child.

TROPICAL TYPHUS

Thirteen cases of tropical typhus were reported from the rural districts during the year, as against 5 in 1950, and 10 in 1949. There is some doubt as to where these cases originated. In those unfortunate individuals who contract this disease there is invariably a history of their having been in established endemic centres in the Federation of Malaya. Compared with the mainland of Malaya where a considerable rise in cases of tropical typhus has been noted in recent years, the incidence is very low in Singapore, and as yet there is no incontestable evidence that there are endemic foci in the Colony. Recent advances in methods of treatment have robbed the disease of its terrors. Preventive inoculation so popular a few years ago is not considered to be of value now. That the disease may invite added interest in the future is a possibility, but on the basis of present experience this contingency seems to be remote.

CHICKEN POX

There was a very much greatly increased incidence of chicken pox in the rural areas during the year. Compared with 1950 when 71 cases were reported, there were 186 cases in 1951. This disease sustains its nuisance value, as each case reported rouses the fear that small-pox has at last gained entry from the ring of infected countries by which Singapore is surrounded. Immediate investigation and careful diagnosis is required in every case in consequence.

ENTERIC FEVER

Enteric fever was evident in 49 persons in the rural areas. The rarity of infections from this group of organism locally is surprising. Although the incidence is small the disease follows the usual monthly distribution in Malaya and occurs during the seasons of heavier rainfall. This is what would be expected with a water-borne disease. Flies tend to be more numerous when the soil is damp and the surface collections of refuse are moist. The commonly accepted theory that all typhoid fever is caused by hawkers may not always be correct and may well lead to the ignoring of the equally important questions of general sanitation and distribution of water supplies. A sudden increase in cases in a definite area or among one section of the population should cause attention to be directed to the discovery of a hawker carrier, or other food source. This, in fact, happened during the year when an outbreak started in December. On the first of that month a Chinese dinner was held in Lorong Ah Soo to celebrate a wedding; fourteen days after this the first case fell ill and was diagnosed. In all there were 30 cases out of which 2 relapsed. On investigation it was found that the food eaten at the dinner had been prepared in the City and heated in the house. Among those who had taken part in its preparation there was strong serological evidence of two being carriers although both were continuously negative to bacteriological tests. Ice-cream eaten at the reception was suspected but on closer enquiry it was found that while some cases did eat the ice-cream, not all did.

LEPROSY

A total of 79 cases of leprosy was notified from the rural areas during the year, compared with 81 in 1950. The incidence of the disease still remains as high as ever. It is possible that the success of treatment so widely reported is bringing out lepers from hiding in the hope of cure, and that in a few years' time the number of new cases will fall. The problem created by this disease still remains a major one in view of the total number to be cared for by the Colony—over a thousand.

MEASURES OF IMMUNISATION

Vaccination against Small-pox

Attention has already been drawn to the fact that Singapore is surrounded by countries in which small-pox is endemic. This country has depended for its freedom from this disease during the last four years primarily on two measures, sea and air quarantine and the herd immunity of the population against the disease. There is today some justification for the belief that mass immunity to small-pox is not of a high order in Singapore.

In pre-war years, as is the case now, infants in Singapore were systematically vaccinated; those who could have evaded this process must have been extremely few. Furthermore, immigrants coming from infected ports or by infected ships—the majority of arrivals are from such ports—are invariably vaccinated at the quarantine station unless proof of adequate protection is available. This measure, incidentally, also helps to protect a large number of locally domiciled people. Thus the regular pilgrimages to Mecca, are, in some measure, responsible for the immunisation or re-immunisation of a fairly large number of Malays. The importance of this emphasis on the vaccination of immigrants lies in the fact that up to the end of 1941 the population of Singapore increased to a significant extent by such accretions.

In 1935, following an outbreak of small-pox, more than 150,000 persons in the Island were vaccinated, and again, on the outbreak of hostilities in the Far East, the measure was repeated in late 1941 at the many emergency centres established for the purpose. Then in March, April, May and June 1942, on the orders of the Japanese, which were promptly obeyed, more than 600,000 Singapore civilians were vaccinated with lymph prepared by the Institute for Medical Research, Kuala Lumpur, and brought to Singapore in January of that year. The estimated population of the Island for the year 1941 was just a little under 770,000.

The lymph issued by the Japanese during the period of the Occupation, however, was apparently of variable potency, while the unsatisfactory conditions of storage then obtaining could not have helped to preserve whatever virtue it possessed. For this reason, and because vaccination measures subsequent to the initial effort in early 1942, were neither sufficiently stringent nor systematically performed, it is thought that a fairly large percentage of children born during the years of enemy rule were not well immunised. The events of early 1942 when more than 75 per cent of the people of Singapore were vaccinated would in themselves have conferred a high level of crowd immunity even on an imperfectly protected community. The unorthodox behaviour of small-pox which prevailed from May 1946 to March 1947 contributing only 152 cases with 42 deaths in a period of 11 months confirms this belief.

Since 1947, re-immunisation of adults has not been carried out to any great extent, and the lapse of four years is certain to have increased the number of susceptibles to a dangerous level. This situation is fully appreciated and the Public Health Conference has recommended to Government that mass vaccination, at first on a voluntary basis, should be put in hand as early as possible. Arrangements for such a Colony campaign are nearing completion and will be in operation in early 1952. During the year 10,231 primary vaccinations were done in the rural areas.

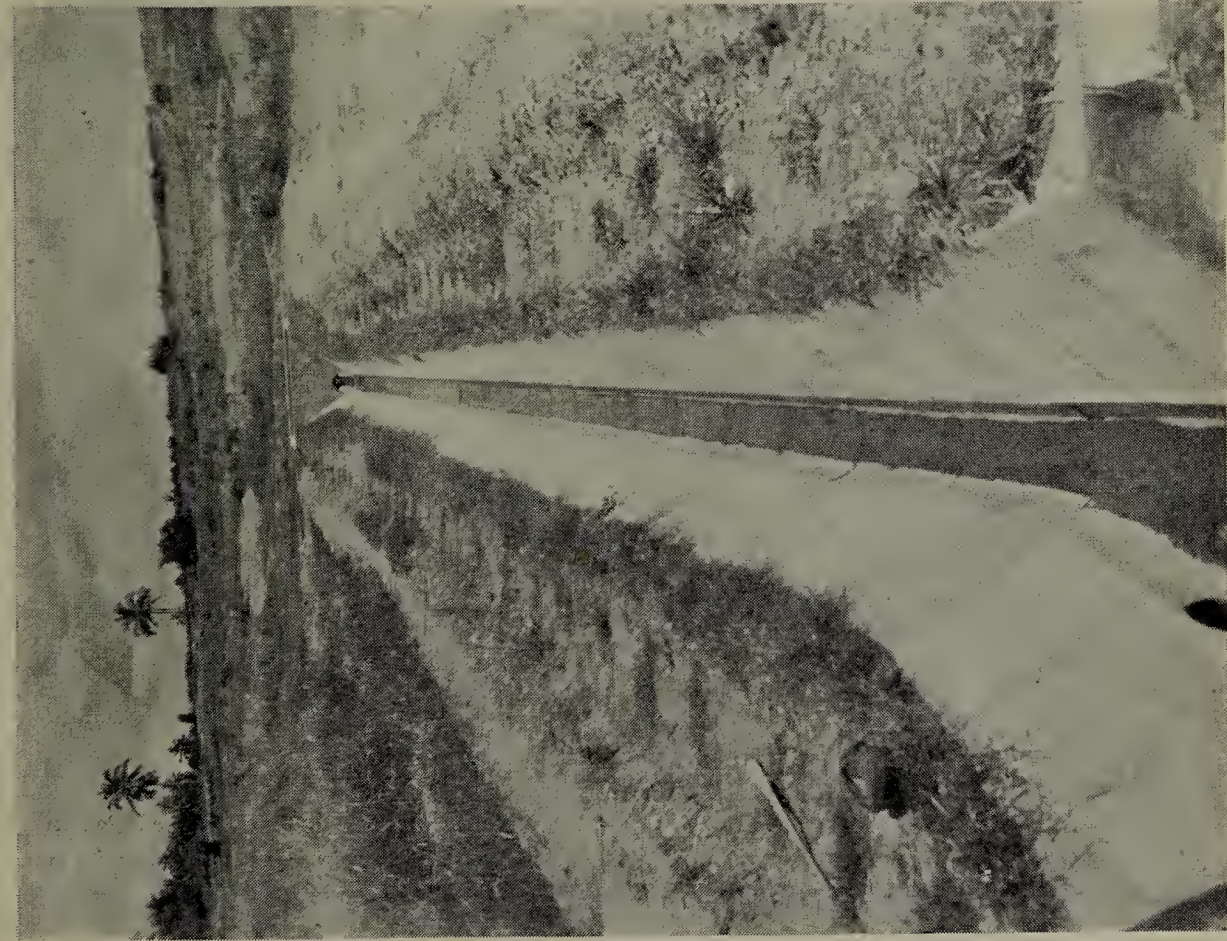
Immunisation against Diphtheria

Attention has already been drawn to the increasing incidence of diphtheria in the Colony. Preventive inoculation against this disease has been a feature of the infant welfare centres in the urban and rural areas for some time now. Although every encouragement is given to parents and guardians to bring children to the various clinics for this purpose only some 25 per cent of children born have been so protected. If further health education and propaganda fail, legislation to make this measure compulsory will need serious consideration.

A total of 2,862 children between the ages of ten months and five years were immunised against diphtheria by the rural Maternity and Child Welfare staff in 1951.

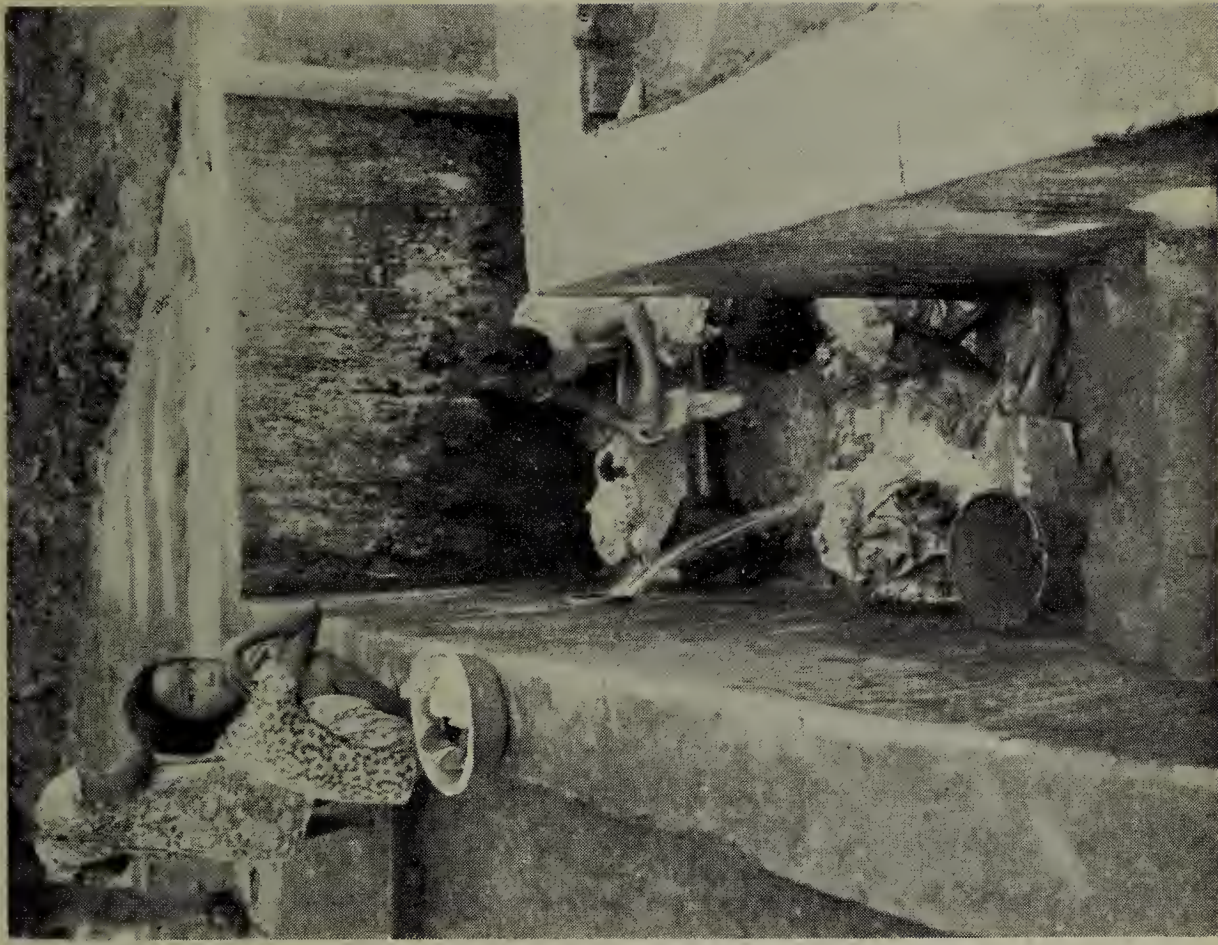
B.C.G. Campaign

This is discussed in Chapter Twenty.



Public Relations

An Anti-malarial Outlet Drain



Public Relations

Anti-malarial Washing Well



Public Relations

Anti-larval Oiling Measures



Public Relations

An example of man-made Malaria. Bulldozing has exposed numerous seepages in a very malarious countryside



Public Relations

Village Sanitation—Refuse being removed in Hand Carts



Public Relations

A Village Incinerator



Public Relations

The Origin of a New Village

CHAPTER NINE

HYGIENE AND SANITATION IN THE RURAL AREA

INTRODUCTORY

FOR the purposes of sanitary control the Rural Area is divided into six districts. Each district has one sanitary inspector in charge, except in the largest where there are two. These inspectors exercise direct authority in their respective areas, their work falling under the following headings:—

- (a) anti-malarial control and malaria;
- (b) sewage and refuse disposal;
- (c) water supplies;
- (d) offensive trades;
- (e) housing;
- (f) food;
- (g) infectious diseases.

Besides the above, there are further duties in the City Area which are the responsibility of the Government. These come under the heading of general sanitation of Crown Lands and Government buildings, and another sanitary inspector is in charge of this work.

Each inspector has under him a varying number of technical subordinates who in turn supervise the labour force in each district.

Mosquito control is covered by a centrally administered mosquito squad which visits all parts of the Rural Area to maintain a constant check over all potential breeding places of dangerous mosquitoes. This squad also carries out special surveys when called for.

While it has been possible to augment the senior staff to two health officers, the number of sanitary inspectors remains dangerously low in view of the work to be done. The response to an advertisement calling for applicants was very poor. Only one suitable candidate was found, and he refused the terms of service offered. During the year the Public Health Supervisor proceeded on study leave to the United Kingdom to qualify in sanitary engineering: his work is now performed by an officer on a temporary basis.

Considerable discontent was voiced by the technical subordinates over their terms of service. As a result of a petition from their Union, a committee was set up and held meetings with representatives of that Union. A new scheme has been put forward which is now awaiting confirmation. A better response has been forthcoming to a recent advertisement for probationer technical subordinates and three have been taken on.

When it is considered that the Department controls one of the largest labour forces on the Island the small amount of labour trouble experienced is gratifying. With effect from 1st July, 1951 a general increase of 16 cents to the basic pay of a labourer, in addition to an increase in the Cost of Living Allowance, came into force. But with certain sections there is still discontent. Particularly is this so with labourers who have to act as nightsoil toties, and increasing difficulty is being found in maintaining a full complement of the men required. The posting of a Welfare Officer to the Department has been of inestimable value. This, with the increase in wages, probably accounts for the absence of major labour disputes. The Welfare Officer has successfully dealt with many minor personal grievances.

Accommodation for labourers is still a problem as most are not in occupation of Government quarters, and the housing allowance of \$6 per mensem does not meet the expense of living in private houses.

The rising cost of living continued to hit all members of the staff, but more especially the labourer. Because of this one district inspector started a vegetable garden for the benefit of his labour force using compost from the same district. During the year a considerable quantity of vegetables was issued free to all families in the force in that district. This is an example of self-help which is being encouraged.

Health education and propaganda by the *visual* method is being steadily built up through the maternal and child welfare clinics with the idea of eventually making the rural health centres contemplated for each of the eight rural divisions a sort of district health museum. The St. John Ambulance Brigade co-operates in the rural clinic field by running canteen centres—a very useful and valuable addition to the Government work.

MOSQUITO CONTROL AND MALARIA

Malaria control was begun in Singapore in 1911 when the results of the first area treated showed an immediate success. As work advanced there was a progressive and rapid fall in the spleen rate. A great malarial wave in 1911 raised the death rate to 85.83 per mille in that year. By 1923 a remarkable improvement had been effected by the extension of anti-malarial work in Singapore. Neglect by the Japanese again created a vast malaria problem which necessitated extensive field work and drug prophylaxis in 1945/46.

Today there are more than 150 miles of earth drains, 60 miles of concrete drains, and 250 miles of sub-soil drains, protecting approximately 36 square miles of intensely malarious country. When permanent work has been completed in an area, oiling ceases. This allows the oiling areas to be extended until they are all subsoiled; as permanent work progresses, oiling costs are reduced. Work amounting to 492 miles was performed under temporary ditching and oiling control during the year.

Only 36 cases of malaria were reported from the rural districts of the Colony in 1951, and in every instance it was fully demonstrated that these were all either imported (mostly from South Johore) or were relapse cases. How long this happy state of affairs will continue is uncertain. Reports from the Federation of Malaya showed an increase of malaria in the latter part of the year, but this was not reflected in Singapore, although there was a marked increase in the breeding of *A. sundaicus* around the same time. During the last few years there has been little change in the manner of land utilisation, apart from the building of houses, and this alone tends to stabilisation of infection at a low level. An occurrence worth mentioning was observed in a squatter area off Jurong Road, where within a matter of days nine Chinese went down with the disease. On investigation it was found that they had all been in South Johore, employed as wood-cutters, and from the date given, had been infected there. As *A. maculatus* breeds in many places near this squatter area, it is only too easy to see how an epidemic of malaria could have arisen. These cases were all put on suppressive treatment after discharge from hospital, and their residential area temporarily included in the oiling scheme.

Complaints of nuisance from ordinary mosquitoes arising in Government Quarters in the town and from the rural area are still numerous and are dealt with as far as circumstances permit. Many such complaints arise from

persons who think they exercise the most scrupulous care in seeing that their compounds are free from breeding, yet on inspection the discovery of tins and other breeding places is common. Removal of lallang and blukar from Government land surrounding houses has done much to help as all receptacles capable of holding water are disposed of at the same time.

Regular surveys on potential breeding places were carried out as a matter of routine. Special surveys were done when called for. The squad responsible consists of four technical subordinates who have been trained in this type of work and whose transport is a 15 cwt. truck.

During the year, from 229 surveys larvæ were collected from 1,650 places. All were identified and in some cases bred out to confirm the identity. Breeding places are pin-pointed on a spot map with suitable annotations. An examination of this map shows a universal prevalence of *A. maculatus*. A breakdown of the actual breeding found up to date is:—

Species				No. of breeding places	
<i>A. maculatus</i>	115
<i>A. sundaicus</i>	59
<i>A. letifer</i>	7
<i>A. bæzai</i>	60
<i>A. barbirostris</i>	16

Others found included *A. kawari*, *A. kochi*, *A. hyrcanus*, *A. vagus*, *A. separatus*, *A. phillippinensis* and *A. aitkeni*.

In this connection the increased breeding of *A. sundaicus* in August, September and October is to be noted.

In the absence of fresh cases of malaria, adult trapping was not carried out.

A further duty of the mosquito squad is house-to-house spraying on neighbouring small islands. *P. Sudong*, *P. Semakau*, *P. Seking*, *P. Bukum Kechil*, *P. Semulun* and *P. Seraya* are potentially malarial. *A. sundaicus* and *A. bæzai* are the important vectors found on these islands. House-to-house spraying was done once in three months using 'Gammexane' dispersible powder P520—8 oz. powder/1 gallon water/1,000 square feet of wall surface. This measure seems to have been successful from practical data collected. No fresh malaria case occurred on any protected island.

General routine control falls under the usual two categories—permanent and temporary.

Permanent

This was confined mainly to repair or reconstruction of old permanent works, although a successful drainage scheme was completed on Pulau Semakau, having the combined benefit of draining the school padang on the island and producing a water supply for the islanders. New sub-soil drains measuring 1,742 yards were constructed and 21,964 yards were relaid. 11,899 yards of open cement drains were repaired.

Temporary

Brush oiling is generally adopted, but in two districts five per cent D.D.T. in oil is used. Earth drains measuring 866,889 yards (492 miles) had work performed on them during the year. The keeping of earth drains free from grass and weeds in a tropical climate is a never-ending labour. 6,546 yards of new earth drains (3.7 miles) were dug. These were kept free of mosquito breeding by brush oiling, and by using this method a considerable saving in oil is effected with no loss in efficiency. 47,378 gallons of oil were used as against 42,645 gallons in 1950.

Larval control in fish ponds

A comparatively new method of temporary control is in the use of D.D.T. bricks in saw-dust. Bricks are prepared from a mixture of plaster-of-paris and saw-dust in the proportion of one volume of plaster-of-paris to five volumes of saw-dust. These are dried and immersed in five per cent D.D.T. in kerosene or anti-malarial mixture. Bricks measuring 4" × 4" × 3" absorb an average of 10 oz. of the mixture per brick. Sixteen such bricks per acre of water surface should yield 8 oz. of D.D.T. per acre of water surface. It is unfortunate that heavy routine duties prevented proper experiments being carried out. Twenty-five ponds at four different places are under experiment, and the results observed are encouraging. During the months of August, September and October, heavy breeding of *A. sundaicus* occurred in many brackish water fish ponds, and these bricks appeared to give satisfactory results.

In addition to the work done by the Health Division, the Services control large areas in and around their property, and a considerable amount of permanent drainage has been done by them. The Department advises the Services on these matters. This anti-malarial work has a very beneficial effect on those districts bordering on the lands occupied by the Armed Forces.

The population of the rural area is increasing and urbanisation is proceeding apace, so that an increase in both permanent and temporary constructional measures will certainly have to be undertaken soon.

SEWAGE AND REFUSE DISPOSAL

Scavenging

The same outdated methods of refuse disposal still continue. The refuse continues to be collected and carried by hand-carts to the local incinerators or to batteries of large rubbish bins, from which collecting points it is conveyed to the disposal point by a contractor's lorry. Some improvement has been effected. It was the custom for scavenging labourers to work in isolated units or scattered parties, the mandore or overseer spending much time bicycling from place to place in an endeavour to supervise the work. Where possible gangs now work as one unit and make a 'clean sweep' through an area under constant supervision.

Final disposal is by incineration, composting and tipping. The incinerators in use are mostly small and scattered throughout the smaller villages. Composting is carried out in Bukit Timah, at Dunearn Road, and in the Changi District. It is a very satisfactory method of refuse disposal and can be combined with night-soil, or not, as required. The difficulty is to dispose of the final product. The local agriculturalist is conditioned to the use of fresher material and will not trouble to carry the compost away. The chief demand comes from householders interested in horticulture. The Dunearn Road product is not made from night-soil so that it may be used by local gardeners without fear of defilement.

Sanitary Inspectors are most keen on what they describe as 'controlled tipping'. It consists of filling swamps with refuse and spreading a thin layer of earth on top. The liberal use of D.D.T. powder sprinkled on the top of the refuse daily, using a sieve for spreading, has so far controlled flies.

Night-soil Removal and Disposal

The scheme for departmental removal of night-soil from Bukit Panjang and Bukit Timah came into operation in 1950 with two large rehabilitated septic tanks and three night-soil lorries. The disposal tanks and their water

supplies proved inadequate however, and recourse had to be made to some extent to trenching. At Bukit Timah composting relieved some of the load. Elsewhere the old system of removal of night-soil by contractors continued. Any careful examination of the working of this scheme reveals that this method of removal is really a legalised collection for use on vegetable gardens. The contractors tender for a monopoly in this valuable material. The method does, however, ensure that the night-soil is removed from the latrines. The system of direct removal and disposal of night-soil at Bukit Timah and Bukit Panjang was an effort on the part of the Rural Board to remedy the defects in the contract system, but this year the idea of water-borne sewage in the larger villages has taken root and it is possible that in the not too far distant future these will have their buckets replaced by water closets. Unfortunately the agricultural population does not live in villages but in small houses on individual holdings. Rural sanitation will always be a problem in such circumstances.

The creation of a separate cleaning and scavenging division of the Rural Board needs consideration.

WATER SUPPLY

The hope was entertained that the arrangement with the Municipality, now the City Council, for extension of water mains to all parts of the rural area would result in the laying of pipe lines along Jurong Road and Tuas in 1950. This hope has not been fulfilled however. Certain minor extensions have been made during the year but the need for numerous wells, unfortunately, still exists. At the western end of the Island the soil is of a very porous nature, and even very deep wells cease to function during the drier part of the year.

The provision of this public service has been accepted in certain circumstances by the Health Division: where there are permanent anti-malarial works, water supplies are always provided by making use of the water from the sub-soil pipes. In some areas 'anti-malarial wells' form the main source of public supply. It is pleasing to note that where there is a civilian population adjacent to a ravine which is being drained by the Services anti-malarial wells are put in to afford a water supply, an extra expense which the Services are not bound to incur.

The outlying islands are in a class by themselves in this connection. Every year from May to July the water supply in most of these dries up, resulting in considerable discomfort to the islanders.

The need for the creation of a Water Board for the whole Colony becomes more urgent every year.

OFFENSIVE TRADES

The great feature in this respect up to date has been the rapid expansion of the rubber industry in Singapore. Apart from the manufacture from local rubber, considerable amounts of raw material are imported from Indonesia, and this foul-smelling, fermenting substance is transported through the town and country-side to the smoke-houses, pervading the surroundings with an evil odour. The increasing demands for smoke-houses, often in residential or semi-residential districts, led the Rural Board to set aside a special area for their erection. This area lies to the south-west of the Island and is one proposed for industrial development. The problem of extension to an existing factory in an area where its presence is undesirable remains.

In order to try and control the spread of industry and unplanned housing development whilst the major planning of Singapore Island is in progress, the Rural Board has obtained powers over the type of building required. Now all building plans have to be passed by a Special Sites Committee before building is allowed.

The Rural Staff, with very able assistance from the Department of Chemistry, endeavour to advise industrial concerns on methods for protecting staffs from the hazards of industry and in the satisfactory disposal of industrial wastes. Here again the chief difficulty lies in shortage of experienced and qualified personnel.

Since the Japanese Occupation the slaughtering of pigs in unlicensed slaughter-houses has been going on throughout the rural areas, but 1950 saw the removal of all such animals to the City abattoirs. Constant efforts have been made to improve the pigsties and to remove them from residential districts. These efforts have met with only moderate success. The erratic spread of residential property into the rural districts complicates the problem for both the pig breeder and the administration. The breeding of pigs is an essential factor in the provision of food for Singapore, and unless the population is to be supplied with pork from outside sources in the future it may become necessary by a reverse process to protect the pig breeder and agriculturist from encroachment.

The problem of the small dairy and cattle-keeper has become more prominent recently as the City has been removing these people from urban areas. Thus they have to settle within the jurisdiction of the Rural Board. As they have little capital to expend on proper premises a difficult situation arises. As a piped water supply is most desirable for a dairy, the competition between residential areas and the supply of food occurs again. This problem is receiving attention.

Many routine inspections were carried out in working premises and action was taken to enforce normal health requirements. Although many premises were unsatisfactory, smoke-houses continued to be the worst offenders in that facilities for labourers' eating, sleeping and toilet are generally lacking. A desire for a quick profit is too obvious. On the other hand a few model factories have risen where the standard of hygiene and labour accommodation can be favourably compared with the best anywhere.

HOUSING

The shortage of housing and its attendant evil of overcrowding continued throughout the year.

The proper housing of the population is the greatest health problem which faces Singapore. It has been made more difficult up to the present by the lack of a central planning authority with sufficient power over all our villages to ensure that development takes place on proper lines. Each land owner has had his land laid out to suit himself and the result is considerable confusion. Constant effort on the part of the Rural Board is necessary to prevent every main road being lined with inferior shophouses from end to end. Whilst there has been considerable development of the more expensive bungalow type of dwelling, and in the cheap shophouse field, the poor man had still to build for himself. To facilitate the erection of cheaper types of houses by the less well off the Rural Board produced type plans which can be bought for \$1 each. Provided the site is approved these plans automatically pass. Scale models are being built so that the prospective house builder can choose his type and know exactly what sort of house he will get. Unauthorised

building, generally of an insanitary type, still continues, however, although great efforts are being made to control it. The world situation reacted very adversely on building activities during the latter part of the year. The building by-laws of the Rural Board which have been under revision for a long time were at last brought to a state of completion in 1951 and there is every hope that they will come into effect in the near future.

The newer types of labourers' quarters erected by Government are a great advance on any previous construction of this kind and compare extremely favourably with private enterprise of this nature. They afford much better living accommodation than the majority of shophouses. This form of dwelling can be made into a real little home.

The shophouse continues to be one of the greatest hindrances to the establishment of decent living conditions. In a country which depends on the natural movement of the external air for ventilation and comfort, external openings for the admission of light and air should be down the long sides of buildings. In a shophouse the very reverse is the case, and in addition the long shape with a narrow frontage permits of a large number of houses within a small amount of space. The fight for the recognition of a minimum width of twenty feet has been waged throughout the last two years. Some results at long last are beginning to appear in recent layouts. But more stress on greater frontage in proportion to depth is what is really required. With few exceptions shops are family businesses with the owner living on the premises. All available space is sub-let. As a result our towns occupy a much smaller area than towns of an equal population elsewhere.

The incidence of pneumonia and pulmonary tuberculosis is influenced very considerably by congestion of population in ill-ventilated premises.

Brisk activity in building continued and large areas underwent development. The Singapore Improvement Trust was very prominent in this respect.

Unfortunately even in better type residential houses, builders still shy at the extra expense needed to instal a septic tank and prefer the very much cheaper rubber bucket. Until a cheap type of septic tank can be found this problem will remain. It was recommended to the Rural Board that powers should be sought whereby a Health Officer can insist on the installation of a water-borne sewage system in houses over a certain cost; at present no legislation is available to force a householder to instal a septic tank.

The problem of man-made malaria in connection with building schemes is raising its ugly head and action had to be taken on more than one occasion to remedy an unnecessarily created danger. Government will have to be empowered to see that building estates include adequate permanent drainage schemes as a part of the project if serious danger is to be obviated.

FOOD IN RELATION TO HEALTH AND DISEASE

During the year the regulations under the Food and Drugs Ordinance were under revision and improvement in keeping with modern practice was sought. The difficulty in framing such legislation as this is to avoid regulating away the products of conscientious and cleanly countries and yet to keep out the products of insanitary and unscrupulous competitors. An aggravation, and a serious one, to the control of food sold to the public remains in the hawker problem. It is one which must receive further consideration if danger is to be avoided. The increase in acute anterior poliomyelitis in recent times may not be without significance in this connection. Every shophouse and every hut where food is prepared for sale to the public is a food factory, and an approach to the problem on these lines may offer a solution to the present

difficulties. Quite apart from this factor however is the approach the average man and his family has to make in the preparation of food in his own home owing to the housing shortage and to the lack of kitchen space. There is room for the large eating house where the ordinary person can obtain a meal at a reasonable price in consequence.

All food factories and eating houses are inspected by the officers of the Health Division and recommendations follow before licensing. A considerable number of applications have to be refused on the grounds of insanitary premises. Even in cases where the building can be made perfect the sanitary conscience of the workmen, and even of the proprietor, is often primitive. Dirty habits can render the most perfect structure and apparatus ineffectual. True improvement will come when the public refuses to patronise unclean premises. No hawker who prepares his goods in an insanitary hovel, or in the over-crowded kitchen of a shophouse, should properly be considered for a licence.

Where a large section of the population lives in cubicles with no cooking facilities and is forced to 'eat out', the eating house should meet the demand rather than the street stall. Nevertheless the hawker who carries round supplies of fresh meat, of fish, and of vegetables to districts remote from public markets serves a useful purpose, and is a boon to the busy housewife and mother. Proper containers for carriage should be more widely used however.

One Government-managed market continued its successful progress and an additional extension was opened recently. More of these markets are essential. Private markets continued to thrive in the old insanitary way, but continuous supervision kept in check some of the more obviously unhygienic practices. The private markets are commercial ventures and little of the profits are expended on cleansing or proper stalls. The sooner such structures come under public control the better. All markets continue to be the haunt of numbers of unlicensed mangy dogs. As shooting dogs in such areas is impossible, other methods of removal have been suggested by the Board and it is hoped that this nuisance will be removed shortly.

FOOD INSPECTIONS, 1951

Eating Houses	...	...	...	...	10,528
Coffee Shops	...	...	...	...	1,761
Butcher Shops	...	...	...	...	57
Fishmongers	...	...	...	...	3,395
Grocers	...	...	...	...	3,776
Markets	...	...	...	...	2,889
Milk Vendors	...	...	...	...	1,475
Bake-Houses	...	...	...	...	2,252
Hawkers	...	...	...	...	6,069
					<hr/> 32,202

OCCUPATIONAL HEALTH

A feature of post-war Singapore is the rapid increase in its industrialisation. Even by 1939 a considerable number of industrial establishments both large and small had come into being. But the political unrest in surrounding countries, the need for the processing of primary products of adjacent countries which do not possess such facilities, the order and security the Colony gives to its citizens, its better roads and communications, and the considerable port facilities it affords, have naturally tended to attract capital for this enhanced progress in industrial development.

The 1947 Census Report lists 179 categories of persons in employment whose main distribution was as follows:—

COLONY OF SINGAPORE, 1947

	<i>Males</i>		<i>Females</i>	
	<i>Numbers</i>	<i>Percentages</i>	<i>Numbers</i>	<i>Percentages</i>
Fishing	4,823	0.93	58	0.01
Agriculture	20,789	4.02	3,360	0.79
Mining and Quarrying	1,151	0.22	96	0.02
Manufacture, etc.	60,294	11.70	7,780	1.84
Transport and Communications	50,409	9.76	1,452	0.34
Commerce (including Shops) and Finance	76,560	14.80	6,489	1.53
Public Administration and Defence	51,123	9.90	3,187	0.75
Professional Service	5,107	0.99	2,451	0.58
Entertainment and Sport	3,222	0.62	957	0.23
Personal Service	27,545	5.33	18,714	4.42
Other or intermediate Industries	9,461	1.83	2,507	0.59
Total gainfully employed	310,484	60.10	47,051	11.10
Nil (including unpaid domestic service)	206,031	39.90	377,258	88.90
Total	516,515	100.00	424,309	100.00
Population 1951	558,299		483,634	

While more than three-fifths of the total population of the Federation of Malaya are engaged in the five primary producing industries of rubber, padi and coconut cultivation, market gardening and stock rearing, and tin mining, the emphasis in the Colony is on manufacture and distribution and commerce on which more than half of the gainfully employed population is engaged.

Further the proportionately very much greater number of persons engaged in public, professional, recreational and personal services in the Colony, compared with any territory in the Federation, emphasises even more the essentially urban character of the population. A fair measure of the material progress seen in the Island is indicated by the figures for recreational and personal services which definitely point to what a society can afford to maintain on its own.

Quite apart from the small numbers of persons engaged in fishing and small agricultural occupations, the majority are in the following industries:— mining and quarrying of non-metalliferous mine and quarry products: bricks, pottery and glass manufacture: chemical processes and paint manufacture: electro-plating: the precious metal industry: making of electrical apparatus: watches, clocks and scientific instrument industries: hide-curing: leather goods manufacture: the manufacture of foods, drinks and tobacco: wood and furniture industries: paper and cardboard manufacture: welding, brick-laying, stone-masonry, slate laying and road making: painting and decorations: vulcanising, milling and charcoal burning: dynamo and engine driving: selling goods and other commercial and financial occupations: carriage and transport of fire-arms: explosives and other hazardous materials: the storage and distribution of petroleum and petroleum products: and a host of other occupations.

It will be noted that many of these occupations carry industrial hazards and can give rise to occupational disease.

The health and welfare of individuals in relation to the physical and psychological demands of their occupation, and of work and work environment, are the responsibility of a number of departments. There is as yet no composite or comprehensive legislation, but control and care are vested in various authorities under the following Ordinances and rules made thereunder:—

1. Machinery—(Chapter 206) Rules G.N. 2142/31 and subsequent amendments.
2. Petroleum Ordinance (Chapter 211 and the Rules); Municipal By-laws, Transport and Storage G.N. 2270/26; Rural Board Transport and Storage G.N. 2282/10; Rural Board Storage of Dangerous Petroleum G.N. 578/22; Petroleum (Transport by Water) Rules G.N. 1554/37; the Petroleum (Amendment) By-laws G.N. 4028/40; the Petroleum (Transport by Water and Storage Fees (Amendment) Rules; the Petroleum (Storage of Petroleum and Dangerous Petroleum) By-laws G.N. 282/10.
3. Arms and Explosive Ordinance (Chapter 196); Rules under Section 37, Explosives G.N. 519/15; Subsidiary Legislation S.S. 587/13; Fireworks Factories Rules G.N. 200/39; Part IV Importation and Exportation; Part X Testing of Explosives.
4. Merchant Shipping Ordinance (Chapter 150); the Singapore Port Rules G.N. 2696/36. The Port (Dangerous Cargo) (Amendment) Rules G.N. S 229/50.
5. Ports Ordinance (Chapter 149); the Singapore Harbour Board Dangerous Goods Ordinance; The Singapore Harbour Board By-laws List of Dangerous Goods G.N. 154/37.
6. Electrical Lamp and Electrical Appliances Ordinance, 1936.
7. Municipal Ordinance (Chapter 133); Rubber Factory By-laws G.N. 787/17; Fireworks and Matches By-laws G.N. 1174/32; Dangerous and Offensive Trade By-laws G.N. 2012/40; Qty. Acetylene Manufacture By-laws G.N. 5215/46; Calcium Carbide By-laws; Control of Stream Pollution; Control of Nuisances; Municipal Celluloid By-laws; Storage of Firewood and Charcoal By-laws.
8. Pineapple Industry (Chapter 166 and the Regulations thereunder).
9. Hydrogen Cyanide (Fumigation Ordinance, 1947).
10. Weekly Holidays Ordinance, 1949.

For a clearer appreciation of the distribution of functions it is necessary to outline the Government of the Colony. There is a Central Government with a Legislative and an Executive Council and numerous executive departments. In addition there are two local Authorities—

- (a) the City Council which has jurisdiction in this respect over 31 square miles of Singapore Island in a heavily built up and extremely congested area;
- (b) the Rural Board which has similar jurisdiction over the remaining area of 193 square miles.

Many of the functions carried out under the above Ordinances and Regulations are those of the Central Government. The Police, the Departments of Chemistry, Labour and Medicine take an active part in the provision of health and welfare for the worker. The local authorities are mainly concerned with the licensing of dangerous and offensive trades, and the provision of what can be described as environmental health services with minimum physical standards in factories and industrial establishments.

The Labour Department through its Chief Inspector of Machinery undertakes the protection of the worker from the hazards arising from dangerous or defective machinery. Regular inspections of boilers, engines, generators, gas-colders and motor, etc. are made. The likelihood of accidents is further minimised by surprise visits of inspection, by safety guard provision, and by specifying and examining the grades of technicians for the various plants. The use of machinery adjudged as dangerous to the worker or as perpetuating a nuisance by reason of noise from sirens, exhausts, etc. are prohibited.

The Labour Department has no statutory powers in the control of hazardous materials. In this respect attention is drawn to the Protection of Workers Ordinance (No. 9 of 1938) which appears to provide for this control but in fact mainly confines its activities to shipping. The Labour Ordinance is directed to the welfare of the worker as regards wages, medical care, hours of work, sanitation and hygiene of the working place, maternity and child welfare benefits and so on. It maintains liaison with other Government Departments, especially the Medical Department, whose officers have Statutory Duties under the Labour Code.

The Department of Chemistry through its Chemical Inspectorate tests the flash point of petroleum samples, carries out tests on petroleum carrying ships for inflammable vapour, inspects vessels after carriage of non-dangerous petroleum before they are subject to repairs requiring hot treatment, tests fireworks, inspects explosives (due to land) on board ship and certifies that they may be landed, tests explosives before permitting in port for stability, inspects tanks or ships for toxic vapour, and advises on storage of dangerous or other cargo in factories. It maintains close liaison with the Marine Department, the Singapore Harbour Board, the Police, the Government Health Department and the Rural Board. It carries out over 1,200 examinations, inspections and tests per annum.

The Marine Department holds statutory authority for the control of hazardous and dangerous materials afloat. It enforces the conditions attached to berthing, storage and fire-safety, loading and discharging, and permits or otherwise any ship with dangerous or explosive cargo to enter the limits of the port. For expert technical advice it depends on its gazetted Inspectorate from the Department of Chemistry. Liaison is maintained with the Singapore Harbour Board which is responsible for dangerous or hazardous materials once landed in the port precincts, with the Marine Police and the City Council Fire Brigade. Packing and storage are in accordance with the Board of Trade Memorandum on the Carriage of Dangerous Goods and Explosives in Ships, 1947. (See Ministry of Transport.)

The Singapore Harbour Board is responsible only for the landing and lighterage of dangerous goods and not with manufacture, packing or sale.

The Police Department is the licensing authority for Arms and Explosives. It makes monthly inspections of all granite quarries, licenses and registers all owners and dealers, records exact details of arms and explosives, licenses the manufacturers, importers and exporters, the place of manufacture or storage, controls transport by road and inspects with right of entry to all premises in connection with explosives. The Police maintain close liaison with the Department of Chemistry, Fire Brigade, Railways and Marine but they are concerned only with such items as are gazetted under the Arms and Explosives Enactment.

The Railways receive, load, and dispatch such dangerous and hazardous materials as may be dispatched by rail according to Regulations which prescribe time of loading, packing, amount, etc. They are solely responsible for the control of movement of traffic by rail.

The Public Works Department is responsible for the maintenance of safety standards of electrical equipment and installations. This Department uses certain dangerous and hazardous materials and stores them for other Government Departments. Their storage and use are strictly regulated.

The Singapore Rural Board is a Licensing Authority within its area for dangerous and offensive trades, all factories, petroleum storage, and the pineapple industry. Much of its health work falls on the Government Health Department. Health Inspectors with R.S.I. qualifications under qualified Health Officers and Building Inspectors carry out this work. Liaison is maintained with the City Fire Department whose advice is followed in regard to fire precautions and the control of inflammable materials. Safety precautions in industry are under the Machinery Department of the Labour Office. The Department of Chemistry advises on special hazards on industry. The legal machinery for control in this direction is not too stringent as the main objective is general hygiene of gazetted offensive trades and the control of processes and industries where nuisance arises. The Rural Board has a Zoning Committee for the control and planning of areas set aside for industry.

The City Council maintains general hygienic and other standards within the City limits in the interest of the public and the worker. It controls risk of fire and plans layouts with regard to fire hazards. The work is mostly entrusted to Sanitary Inspectors with R.S.I. qualifications under qualified Health Officers.

The control of food and drugs is shared by the City and the Government Health Divisions. The latter also is in charge of Hydrogen Cyanide.

In the United Kingdom arrangements, the overall salient feature ensuring uniformity and effectiveness is a very great measure of control in a few Government ministries, namely Labour, Health, Home Office and Transport. Regulations for the whole country—however to be implemented—are made, and powers are taken under specific Government Acts, e.g. Factories, Alkali Works; Explosives; Petroleum; Premises Drainage; River Boards, etc. Executive enforcement in general rests very largely on three Government inspectorates, viz. : Factories, Alkali and Explosives. Where implementing action is delegated to Local Authorities, this is *statutorily imposed* in the relevant Act and is carried out under the Act or Regulations made thereunder.

In late 1950 a Committee was appointed 'to investigate the possibility of co-ordinating the various industrial and commercial safety controls relating to lighterage, loading, handling, storage, manufacture, packaging and sale of hazardous materials'. This Committee's deliberations have recently been completed and its Report should be available soon.

The expanding Government hospital services are free and it is through this organisation and through an increase in the understaffed health divisions that progress lies in this important direction at the moment. When these services have been developed to a requisite minimum then specialists in industrial hygiene may well be added.

CHAPTER TEN

MATERNITY AND CHILD WELFARE IN THE RURAL AREAS

THERE are now ten Maternity and Child Welfare Centres in the rural areas with a staff of nurses and midwives on the premises and five smaller centres with a resident midwife only. Regular clinics are held at 25 other places in addition where there is no resident staff. This makes a total of 40 as compared with 39 in 1950. The pre-war policy of conducting this very important work from very temporary buildings and even in the open is not considered suitable under modern conditions or for an expanding service of this nature. Only three small centres have ever been provided with proper Government buildings so far and the Medical Plan seeks to remedy this state of affairs. Two new clinics on really up to date lines with accommodation are under construction and will be in use soon.

Voluntary effort on the other hand is becoming more and more useful. The general public at Bukit Panjang subscribed most generously to funds for the erection of a new centre. This building was opened by the Honourable the Colonial Secretary in May 1950. A large and well-planned structure, it provides ample rooms for clinic and staff accommodation. The public also provided a small restricted centre at Jurong 10th milestone in 1947. The villagers of Kampong Loyang are erecting a building for a sub-centre at Loyang which will be in use early next year.

A recent departure in maternity and child welfare work in the rural areas has been the appointment of Lady Medical Officers. Ever since the inception of a rural scheme in 1927 a public health matron had been in charge, and stress had always been laid on the educational and preventive aspects of the work, treatment and first aid being incidental. The appointment of lady doctors does not mean that undue emphasis will be placed on the curative side of the work, however; active preventive measures will still be pursued. But the detection and remedy of defects—certainly preventive work—will improve, while measures of immunisation will be proceeded with vigorously.

STAFF

The staff now consists of the following:—

Lady Medical Officers	...	...	...	...	2
Public Health Matron	...	...	...	...	1
Supervisor of Midwives	...	...	...	...	1
Health Sisters	...	...	...	...	4
Health Nurses	...	...	...	...	11
Health Midwives	...	...	...	...	26
Health Servants	...	...	...	...	21

Like other divisions of Government Service, Maternity and Child Welfare suffers from personnel troubles. In a section staffed very largely by intelligent and hard working young women resignations through marriage tend to be high. While married women may and do remain in service, residence in an outlying district is very often not compatible with married life. This usually means a loss of experience to the Department. There is also a difficulty in recruiting female health servants as these come from the 'amah' class which is not generally local-born, and can often obtain a higher salary in private service. Locally born women are not attracted by this work and can seldom be recruited.

One local health nurse who spent two years in Australia on a scholarship returned in July greatly benefitted by her training. Like another who returned in 1950, she has demonstrated in a most forcible manner the advantages which she received during her course of studies. Not only do these women who proceed abroad benefit from the technical education received, but they return with a broadened outlook on affairs in general. This has an undoubted influence for good in the community in which they work. Acting Public Health Matron, Mrs. M. E. Perera, returned from study leave from the United Kingdom in February. The general scheme of duties covered by the nursing staff of the Rural Maternity and Child Welfare centres may be of interest to the reader. It may be summarized as follows:—

- (1) care of mothers and young children;
- (2) care of the expectant mother by—
 - (a) advising on the general, mental and physical well-being of the mother, the preparation for the confinement, the facilities available and any social help required;
 - (b) attending the ante-natal clinic in her district so that she can gain further experience by assisting at the Lady Medical Officer's examination and render extra care should the case be abnormal;
 - (c) providing relevant information about home conditions and family history;
 - (d) helping to ensure that the doctor's advice is clearly understood and carried out by the expectant mother;
 - (e) giving health talks and practical demonstrations on subjects of interest and importance to expectant mothers, e.g. general hygiene and diet;
 - (f) providing iron and vitamins where necessary. At these clinics the midwives are held responsible for a regular series of intermediate examinations;
- (3) home visiting—
 - (a) advising parents, foster-parents and expectant mothers as to the best means of promoting their own health and welfare and that of their families by a knowledge of parent craft, household management and home making. This includes visiting the homes of children born in the area to which she is assigned, or removing into that area, until they reach school age. The family is treated as a unit so that advice is given up to school-leaving age and covers general, mental, physical and emotional development;
 - (b) following up at frequent intervals children found to be suffering from illness, defects or handicap. Looking after adopted children and children cared for in homes other than their own;
 - (c) following up families with a social problem with particular reference to neglected mothers and neglected children and forwarding particulars to the Social Welfare Department;
 - (d) investigating causes of still-births, neo-natal and accidental deaths, with subsequent visits to homes in which these have occurred. Routine visits at the end of normal puerperium. Extra visits in abnormal puerperal cases;

- (e) observing the environment of all children, the cleanliness of their homes, and reporting sanitary defects or overcrowding;
 - (f) carrying out special enquiries relating to applications for admission to hospitals and convalescence and summoning the ambulance if necessary;
 - (g) visiting cases returning from hospital. All such cases are referred to the Health Visitor by the Hospital Almoners;
 - (h) ensuring that sleeping accommodation and good home care are available for all children discharged from hospitals;
 - (i) advising on the prevention of accidents;
 - (j) assisting with special investigations and departmental surveys;
- (4) duties in Maternity and Child Welfare Centres:

The Health Visitor is responsible for the general administration of the Centre, for the maintenance of equipment and records, and correlation of the Centre's activities. Duties include—

- (a) interviewing all mothers attending Maternity and Child Welfare sessions; selecting those to be referred to the Lady Medical Officer;
 - (b) ensuring that the doctor's instructions are clearly understood and carried out by the mother;
 - (c) preparing the programme of Health Education including the preparation and maintenance of demonstration material. Individual teaching in the buying, preparation and serving of food (available in their own gardens) the aim being to assist the utilisation of local products, all essential nutrients being provided by cheap but body-building foods, e.g. fruits, vegetables, etc.;
- (5) prevention of infectious disease:
- The Health Visitor plays an important part in the prevention and control of infections and illness.

DOMICILIARY MIDWIFERY

The midwives attached to the Maternity and Child Welfare centres attend to mothers during normal confinement at home. Abnormal cases requiring urgent medical attention are accompanied to the hospital by the midwife herself. Abnormal ante-natal cases requiring attention by the Lady Medical Officer, but not urgent, are referred to the clinic. New-born infants are also sent to hospital for treatment when necessary.

Routine puerperal visits are made daily for ten days. The Health Nurse follows up all cases confined in her district, i.e. cases attended by Government midwives, private midwives or self-confined.

SUPERVISOR OF MIDWIVES

The Supervisor of Midwives is responsible for the inspection of midwives practising in the Rural Area. In puerperal cases not serious enough to be hospitalised, the mother is reported to the Health Nurse and then to the Supervisor of Midwives. Cases of puerperal pyrexia are reported to the Health Officers.

POST-NATAL SERVICE

Mothers attend for examination six weeks after confinement. Advice is given by the Health Nurse, and where necessary mothers are referred to the Lady Medical Officer.

ADOPTION OF CHILDREN

Continuous supervision of adopted and foster-children is carried out. These children are investigated and referred to the Department of Social Welfare. Deaf, blind or crippled children are also investigated and referred to the Department of Social Welfare.

In spite of staffing difficulties, the Department's maternity service expanded further during the period under review. While nurses and midwives were directly concerned with the births of 7,708 infants in the rural areas of Singapore out of a total of 13,337 rural births, practically all births came under review. New leave regulations which compel the staff to take vacation leave during the year is a factor which retards work, for ordinarily the accumulation of leave for a period is not possible. Then the fact that the staff is unable to be in more than one place at once, the difficulties involved in reaching houses, particularly if the case occurs at night, and the considerable distances to be covered, are some of the reasons why confinements in the rural areas cannot in all cases be attended. So increased staff and better transport are essential if this difficulty is to be solved. And this means more accommodation for staff and more clinics. As a rule, the husband or some near relative calls for the midwife, and provides such transport as is available. He acts as an escort at night. The present aim is to see that at least each Sister has a car and that each nurse or midwife has a bicycle at her disposal where a common vehicle is impossible.

Even with a complement of 26 midwives it is obvious that the maternity staff is seriously overworked. If an efficient rural service is to be supplied to meet the demand there must be a large increase in the number of midwives. Again this means more accommodation. This is not a service where the ideal of an eight-hour day can be applied. The master in this situation is the unborn baby and it cannot be concerned in collective bargaining until a later date in its career. As far as is possible each midwife and nurse can count on alternative week-ends being free for her. At present it is inevitable that many babies are born before the midwife arrives, and the number of cases to be seen makes proper attention difficult.

There is a particularly great need for intensive work amongst the Malay community. Here infant and general mortality rates continue to be high as compared with the other races. Health education amongst Malays can only become effective when more and more well educated Malay women and girls become available as nurses and midwives. Unfortunately most of those who qualify are not willing to face hard work in the kampongs for long. In the present service there are only two Malays. Thus the unqualified *bidan* will continue to ply her trade although officially there are only three such women left in the rural areas.

The Lady Health Officers hold special clinics at each of the larger health centres in turn and abnormal pre-natal or post-natal cases are collected and referred to them from the surrounding districts. They also advise and treat women and young children who are suffering from disease not connected with child birth. It is true that this is a function which is really outside the sphere of infant welfare work, but in many cases no other medical attention is available, and unless this service is given the confidence of the population is lost.



Public Relations

Infant Welfare Centre, Jurong Road, 10th milestone



Public Relations

A new Maternity and Child Welfare Centre



Public Relations

A session in a Rural Infant Welfare Centre, Bukit Panjang



Public Relations

Post-natal Clinic



Public Relations

Rural District Ambulance



Public Relations

Travelling Dispensary

The following table gives a resumé of the 1951 work in this respect:—

(a) Homes visited—					
(i) Nurses	...	...	...	...	21,814
(ii) Midwives	...	...	...	...	42,347
(b) Cases seen at home	...	...	...	...	53,786
(c) Nursing visits by midwives	...	...	...	...	34,912
(d) Confinements attended	...	...	...	...	7,708
(e) Mothers in labour sent to hospital	...	...	...	...	356
(f) Clinics—					
(i) Infants	...	...	...	...	88,217
(ii) Children over one year	...	...	...	...	39,539
(iii) Ante-natal mothers	...	...	...	...	25,619
(iv) Post-natal mothers	...	...	...	...	11,804
(v) Primary vaccinations	...	...	...	...	10,231

Free Milk Distribution:

(a) No. of feeds to mothers	...	...	...	112,980
(b) No. of feeds to children	...	...	...	548,655
(c) Powdered Milk used (in pounds)	...	...	...	21,303

These figures appear to be less than some previous statistics. In practice this is not the case as special care has been taken in this survey to include proper visits only and not mass house visits.

VITAL STATISTICS FOR THE RURAL AREA OF THE COLONY OF SINGAPORE

1. Population (mid-year)	...	...	293,986
2. Death rate	...	...	9.8 per mille
3. Birth rate	...	...	45.4 per mille
4. Still birth rate	...	...	12.2 per mille of births
5. Infant mortality rate	...	...	65.4 per mille live births
6. Maternal mortality rate	...	...	1.61
7. Neo-natal mortality rate	...	...	23.4

A plan for the reorganisation of the Rural Maternity and Child Welfare work on a regional basis has been worked out. There are to be seven regional centres staffed with sisters, nurses, midwives and health servants, anti-malarial overseers, and hospital assistants. The latter will run a static dispensary service also in each region. In addition, there are to be a number of residential maternity and child welfare centres with resident nurses and midwives only, supported by a further series of subsidiary and clinic centres. Some 100 centres of various kinds is the aim.

It is hoped that as this part of the Medical Plan unfolds, each regional centre will eventually become a fully equipped Rural Health Centre.

The travelling V.D. dispensary is linked to the rural welfare centres at present and this will continue. A travelling dental unit is to be added. Whether a mass X-ray set is to operate outside the Tuberculosis Centre is a matter for future study.

CHAPTER ELEVEN

FLOATING, TRAVELLING AND STATIC DISPENSARIES IN THE RURAL AREAS

DURING the year the newly commissioned h.l. *Tengku Hussein* became a familiar visitor to all the neighbouring islands. This floating dispensary with a hospital assistant in charge is a new advance in the 'island' service bringing treatment, advice and health education to the small communities living off the shores of Singapore Island proper. It is very much appreciated. At first the islanders were diffident and un-co-operative: now they come readily for treatment. As a result, there has been a great improvement in the health of these people. This floating dispensary works to a strict time-table and visits all islands except two once a week. These two lie in the Straits of Johore and are visited monthly. This is a service which must be extended. A provision of a further launch is to be sought. Medical Officers and health visitors, and medical and sanitary experts, frequently accompany the launch for inspection and advisory visits.

By land the rural area is served by three travelling dispensaries, each in charge of a hospital assistant. In addition to these the School Medical Service operates another specifically for school children. These travelling dispensaries also work to a schedule and most districts are served once or twice a week. A new vehicle was commissioned in the early part of the year.

44,224 attendances were recorded in this respect. Of these 25,150 were new cases. The value of this service in areas with a scattered population is becoming increasingly evident. While such transitory aid may not be the ideal it is a very important addition in such areas. It is hoped to add further travelling and floating dispensaries to the present fleet within the next two years.

There are three static dispensaries at Bukit Timah, Paya Lebar and Pulau Brani. The Paya Lebar clinic is situated just within the City Council area but it serves a thickly populated section outside this limit in addition. Part of the dispensary building at Bukit Timah is used as a Maternity and Child Welfare clinic and the Paya Lebar dispensary is also used for similar and school clinic sessions.

Another new departure is the rural travelling venereal diseases dispensary clinic. While venereal disease is specially treated at the clinics of the Social Hygiene Division in the City, this additional service is paying dividends as a reference to Chapter 21 will clearly indicate. Certainly it is not desirable to use Maternity and Child Welfare Centres as venereal disease clinics in the strict sense of the term. Nevertheless it is quite proper that such cases from amongst the normal attendances should receive proper advice and attention as a routine measure of ante-natal control.

There are an increasing number of cases in the rural districts where fairly large concentrations of population exist. In consequence there is a growing demand for static dispensaries throughout the Colony. Thus it may well become necessary to provide more than the three extra large and separate buildings suggested for this purpose in the Medical Plan which are in addition to those to be incorporated in the new welfare centres as a part of the general health scheme outlined for rural areas in the previous chapter. Added staff accommodation again becomes a necessity and a priority.

CHAPTER TWELVE

PORT HEALTH AND QUARANTINE

THE work of the Port Health Division continues to be carried out by a skeleton staff with two Port Health Officers. Despite this more ships were inspected at the quarantine anchorage during the year than in 1950 or 1949. That there was very little increase in the actual number of passengers dealt with was due mainly to:—

- (a) unsettled conditions in China;
- (b) stricter enforcement of visa regulations by the Department of Immigration; and
- (c) the limitation of passenger licence to certain ships.

With the increasing incidence of small-pox and other dangerous communicable diseases in neighbouring territories, and the fear that the level of communal immunity to small-pox in particular is not of a high order today in Singapore, a greater vigilance was kept on ships arriving from infected areas than ever before. But for this, at least one variola case with its contacts would certainly have entered the Colony and probably generated an epidemic. This incident demonstrates that constant watchfulness which has to be maintained even in the case of ships arriving from 'clean' ports if the entry of infected or infection-bearing immigrants is to be prevented. When the m.v. *Tjiwanji* arrived from Hongkong on the 5th of March she had on board one case of small-pox, two cases of measles, and three cases of chicken-pox. The presence of these cases was not revealed by the master, surgeon or chinchew: the entry declaration did not declare the presence of any infection on board ship. Hongkong at that time was a 'clean' port. The cases were discovered by the Port Health Officer. On investigation it was found that the passenger with small-pox was from Swatow, a port infected with small-pox, and had travelled to Hongkong on another vessel and embarked in m.v. *Tjiwanji* in the roads of Hongkong. Our good fortune lay in the fact that this vessel carried more than 25 deck passengers. Had these been less, the vessel would have been granted a free pratique in compliance with Rule 9 of the Quarantine (Medical) Rules, 1937, and the cases would have been landed in Singapore with disastrous results.

The health control of the numerous junks and small craft entering the Port is an extremely difficult matter. Additional staff alone is not the complete answer to this problem. This serious breach in our quarantine chain has been pointed out in previous years' reports. Increasing vigilance has been exercised but even under the best of conditions the control of these vessels would be difficult. With major infectious disease surrounding Singapore, extreme care is essential. There is a considerable traffic in vessels under ninety tons plying between Indonesia and this Colony, and these vessels carry not only merchandise and human beings, but also rats. There is strong evidence that sylvatic plague at least exists in Java and the possibility of extension of infected rodents to Singapore must always be kept in view.

Since the gazettement of Djakarta as infected on account of small-pox, considerable inconvenience has been caused by passengers in transit on K.P.M. vessels plying between Indonesian Ports and calling at Singapore. Rule 19 of the Quarantine (Medical) Rules, 1937, prohibits unberthed passengers in transit from infected ports from going ashore. Despite written undertakings

from masters accepting full liability for any unauthorised quittance by transit passengers from such vessels passengers have been discovered going ashore on several occasions. So all unberthed passengers in such transit are detained at the quarantine station until such time as the ship is ready to sail. This accounts for the increase in passengers quarantined on St. John's Island, e.g. 28,320 for 1951 as against 8,658 for 1950.

Due to improved organisation by the Pilgrim Officer the work of the Port Health Division was lessened when the pilgrimage to Mecca commenced this year. Almost all pilgrims were in possession of the requisite health papers, thus facilitating the inspection at the time of embarkation. Further, the rules governing the increased accommodation from 16 square feet to 20 square feet per pilgrim, together with the altered and improved diet, made conditions much more tolerable for these people.

The following is a summary of the work carried out:—

	1951
Number of ships inspected and cleared	1,979
Tonnage (nett)	5,650.059
Number of passengers inspected on ships at the quarantine anchorage:	
(a) landing	86,623
(b) in transit	50,948
Number of passengers quarantined on St. John's Island ...	28,320
Number of Bills of Health issued	9,080
Number of ships issued with deratization exemption certificates	291
Number of rats destroyed during fumigation and examined bacteriologically:	
(a) destroyed	696
(b) examined	189
Vessels visited to inspect corpses	18
Permits issued to import, export or tranship coffins containing remains	78
Pilgrims' ships with pilgrims:	
(a) ships	3
(b) pilgrims	2,121
Certificates to accompany goods	386
Disinfection of infected vessels	1
Inspection of Bum Boats	129
Inspection of Water Boats	10
Vaccinations and inoculations performed at the North Canal Road Dispensary:	
(a) small-pox vaccinations	11,942
(b) cholera inoculations	14,843
(c) T.A.B. inoculations	164

Up to date vaccinations and inoculations against various diseases for intending passengers have been performed and certificates issued free of charge, but towards the end of the year legislation was introduced whereby a fee is levied. A considerable revenue is expected from this procedure.

THE QUARANTINE STATION ON ST. JOHN'S ISLAND

St. John's is a small island about one mile in length by $\frac{1}{2}$ to $\frac{1}{4}$ mile in breadth, situated five miles due south of the Master Attendant's Pier. A cholera scare in the early seventies led to the erection of an attap-roofed Lazaretto which was completed in November 1874, and in that month 1,300 Chinese immigrants arriving in the s.s. *Milton* with

cholera were landed on the island. St. John's has remained a quarantine station ever since. It was not until 1886 however that our first Quarantine Ordinance was passed. In 1894 the plague epidemic at Hongkong caused the erection of a plague hospital. The quarantine station was finally laid down on its present lines in 1903 under the guidance of Dr. Brooke. There are today special isolation hospital wards for cholera, plague and small-pox, a hospital for minor infectious disease, sixteen contact camps, a dispensary and staff quarters. In its planning much of the natural beauty of the island has been preserved, but the station remains quite deficient in modern accommodation. Nothing can be done at present to improve this as the Prisons Department uses half the existing camps for detainees. The Medical Plan however provides a scheme for the necessary improvement.

The total number of passengers admitted during the year amounted to 28,320. Their racial distribution was as follows:—

Chinese	...	...	...	...	14,520
Indians	...	...	...	...	12,813
Malays and Indonesians	...	...	...	...	908
Others	...	...	...	...	79

The greatest number admitted for health reasons on any one day during the year was 1,184.

The real difficulty with Port Quarantine work in a place like Singapore is its proximity to so many different and difficult areas in a zone subject to so much international tension. Thus something may happen any day demanding a rapid extension of the operations in progress, and this necessitates a constant readiness and the facility to meet this emergency. The present small staff and accommodation must be regarded as a very bare minimum indeed for such a very important mission. Any breakdown would be an economic disaster to such a commercial community as this.

CHAPTER THIRTEEN

AIR HEALTH

THE steady increase in the volume of air traffic arriving at and leaving Singapore continued through the year, and the aircraft arriving from infected or suspected ports totalled 2,023, compared with 1,911 in 1950 and 1,409 in 1949. With a twenty-four hour service in operation, 56,530 crew and passengers were inspected by two full-time Medical Officers. Even in the case of air passengers who might be expected to have been better instructed in international health requirements, 234 had to be put on surveillance for the non-possession of valid certificates of immunisation.

The present airport buildings are not designed to cope with the increased volume of traffic, and plans for alterations to meet the present conditions have now been finalised. One of the main difficulties has been to ensure that medical inspection is carried out before passengers contact their friends or the Press. Many claim V.I.P. status; this privilege is now accorded to very few persons, and a room has been set aside where the public and the Press can interview or contact such persons after a full medical inspection.

The Airport Health Officer also interests himself in the general sanitation of the airport area but particular attention to the elimination of breeding places of the 'Aedes' mosquito, the carrier of yellow fever, has not been possible so far owing to the proximity of overcrowded slum areas. The accidental infiltration of yellow fever may well become a real dread and one against which the Health Authority may have to be constantly on the watch. At present Malaya is protected by the buffer of India, but the possibility of a direct route from Africa to Australia with a stopping place on an island in the Indian Ocean, with a branch route to Singapore, brings the danger ever nearer.

FINAL COMPARATIVE FIGURES FOR 1949, 1950 AND 1951

	1949	1950	1951
Total number of aircraft inspected ...	1,409	1,911	2,023
Total number of passengers and crew inspected ...	30,502	48,073	56,730
Total number of passengers put under surveillance ...	648	1,184	234

CHAPTER FOURTEEN

THE ISLANDS

BEGINNING in 1951 the new floating dispensary visited all the inhabited islands, including Pulau Ubin and Pulau Tekong, once every week except for two which lie in the Straits of Johore. The latter were visited monthly. In addition the launch maintained a regular transport for maternity and child welfare and other health staff which was cut off from other approach, and for equipment replenishment for these places. Medical and health officers also visit Pulau Tekong Besar and Pulau Ubin weekly and other islands less frequently. So greater attention has been possible in matters of anti-malarial control and general sanitation as well as in maternity and child welfare than in any past year.

Pulau Tekong Besar and Pulau Ubin lying to the east of the Colony are the largest of the islands surrounding Singapore. The former has a resident population of some 3,000, of whom more than half are Chinese, the rest Malays. The majority of these people are congregated in three village groups, the kampongs of Selabin, Pahang and Pasir. One Chinese and two Malay schools operate on this island. It has a resident midwife employed by the Government. General sanitation and anti-malarial control are under the direct supervision of a resident technical subordinate of long service. Weekly clinics are held by visiting doctors of the Health Branch. Plans for the construction of a main maternity and child welfare centre cum dispensary will be prepared for the necessary action next year.

Pulau Ubin, the second largest island, has a population of about 1,500 of whom the majority are Chinese. Health on the island has been good. The Health Branch maintains a scavenging and anti-malarial gang, and weekly clinic sessions are held by the staff of the maternity and child welfare centre. Doctors visit frequently. In early 1953 a subsidiary centre with a resident midwife and health servant will be opened.

The two groups of small islands lying off the South West Coast of Singapore belong to a world apart. Some are merely detached portions of the mainland; others are coral reefs covered with sand. In the outer group the most heavily populated are coral banks: the larger islands have few inhabitants. The people are almost entirely Malay fishermen and their families, and being fishermen, the nature of approach to land has been the principal determining factor in their choosing certain islands as places suitable for residence. The populated islands have beaches which can be reached from the sea at all states of the tide. Pulau Sudong for example, with its beaches giving easy access to the sea, is one of the smallest but for its size a heavily populated island. Pawai and Senang are much more difficult to reach. They are also probably more malarious owing to the nature of the ground. At any rate Pawai is supposed to be haunted by ghosts which in the long run are said to kill off all who attempt to settle there. Unless the landing can be improved it is doubtful if an attempt to lay the 'ghost' would be profitable. Dangerous mosquitoes are obviously invading Pulau Sudong, from somewhere, most probably from Pawai.

The following table gives a resume of the facilities available for these islanders:—

Name of Island	Population (1947)	Schools	Maternity and Child Welfare	Medical	Anti-Malarial work	Water supply
Pulau Seraya ..	213	School erected by people of the island. Teacher paid by Government	Three weekly visits by Welfare Nurse	Weekly visit by Floating Dispensary	Nil but healthy ..	Wells which dry up during the hot season.
P. Samulon ..	277	Children go to Tanjong Kling School	Do.	Do.	Malaria controlled by drug prophylaxis	Do.
P. Damar Laut ..	126	Do.	Twice a month at Tanjong Kling	Mobile Dispensary at Tanjong Kling once a week	Nil but healthy ..	Two standpipes available at Tanjong Kling.
P. Damar Darat ..	69	Nil	Three weekly visits attend either Tanjong Kling, Samulon or Seraya	Three weekly visits attend either Tanjong Kling, Samulon or Seraya	Healthy	Wells.
P. Ayer Merlimau ..	89	Nil	Inhabitants go to Seraya	Inhabitants go to Seraya	Healthy	Inhabitants take water from Pulau Seraya.
P. Ayer Chewan ..	39	Nil	The Company has its own staff	The Company has its own staff	Oiling by Shell Company. Some permanent drainage	The Shell Company have their own water supplied by water boats.
. Pesik ..	20	Nil	Weekly visit by the Floating Dispensary	Visiting nurse and hospital assistant	Permanent works ..	Four anti-malarial wells.
. Sekera ..	18	Nil	Do.	Do. Teacher has a stock of medicine supplied by G.H.O.	Two anti-malarial drains. D.D.T. spraying	Two wells.
P. Sebaros (Seburos)? and other islands uninhabited	4	Nil	Do.	Visiting nurse and hospital assistant	D.D.T. spraying ..	Water supplied in drums for drinking purposes.
Pulau Bukom Besar and Pulau Brani in Shell Company Island	2,822	School housed in Shell Company Building and Teacher, is accordingly to Penghulu, probably paid by the Company	Do.	Do.	Permanent works ..	Anti-malarial wells.
Pulau Bukom Kechil ..	526	Nil	Weekly visit by the Floating Dispensary	Do.	Nil	Earth wells.
P. Sudong ..	342	School erected by Kesatuan Malayu. Teacher paid by Government	Do.	Do.	Permanent works ..	Water supplied in drums for drinking purposes.
P. Semakau ..	246	School erected by inhabitants. Teacher paid by Government	Do.	Do.	Permanent works ..	Anti-malarial wells.
P. Seking ..	173	Nil	Do.	Do.	Permanent works ..	Earth wells.
P. Pawai ..	53	Nil	Do.	Do.	Permanent works ..	Earth wells.

Name of Island	Population (1947)	Schools	Maternity and Child Welfare	Medical	Anti-Malarial work	Water supply
P. Sebarok ..	3	Nil	Nil	Inhabitants go to Sudong	Nil	Well water.
P. Senang ..	3	Nil	Nil	Do.	Nil	1 drum.
Pualu Sekijang Pelepah (Lazarus Island)	150 or so	Nil	People from Sekijang, Pelepah obtain their medicine and other health facilities from Sekijang. Bendera the Quarantine Station	From Quarantine Station	Extensive anti-malarial drainage	Good well water, and anti-malarial wells.
Pulau Tekong and Pulau Tekong Kechil	3,540	1. Government Malay School adjoining Police Station Kg. Selabin. 2. Malay School built privately on titled land at Kampong Pasir. 3. Three Chinese Schools function, the oldest one teaching only Chinese. Two other schools have sprung up since the re-occupation—one is giving English lessons as the principal subject whilst the second school is catering for students who cannot get admission in the first school. The 3rd school has closed down temporarily.	<i>Infant Welfare</i> A. Government midwife resident at the island. <i>Maternity Clinic</i> Health Sister and nurse visit weekly with the floating dispensary. A dispensary and infant welfare clinic centre is being built. <i>Infant Welfare</i> Sisters and nurses visit this island weekly from nearby Changi and the floating dispensary. This service is being increased. <i>Maternity Clinic</i> There is a resident midwife.	Drugs by visiting staff at present until the new centre is built	Extensive permanent works plus oiling	Wells. The supply of water on this island is good and plentiful. Some wells have been built by Government and those meant for purposes other than drinking are enclosed by brick walls.
Pulau Ubin ..	1,456	1. Proposed Malay School near Malay Kampong building erected on private land but school is not functioning. 2. "Chinese School at Kampong Chandu Kongsil".	Sisters and nurses visit this island weekly from nearby Changi and the floating dispensary. This service is being increased.	See para. opposite	Oiling	Wells.

In addition to the actual islands there are several small villages on the western side of Singapore Island which are so cut off by mangrove swamps and distance from main roads as to be virtually islands. These villages, for example Kampong Ayer Bajau and Tanjong Murai, are now brought within the sphere of activity of the Health Department.

The provision of a satisfactory water supply for a number of these islands continues to be a problem: Many of them are small and flat, and there is not enough ground water to feed wells particularly in the dry months. It is doubtful even if the making of numerous wells will solve the problem. If these islands are to be kept inhabited augmentation of water supplies by waterboats, at least during times of drought, deserves serious consideration.

The only islands the Medical Department attended to pre-war were as follows:—

Pulau Tekong Besar	...	1 resident midwife, 1 technical subordinate. Some anti-malarial measures and scavenging but control on a very much reduced scale compared to the present.
Pulau Ubin	...	Anti-malarial and scavenging but on a much reduced scale compared to the present.
Pulau Bukom Kechil	...	Very rare visits. Some minor permanent anti-malarial works.
Pulau Sudong	...	Rare visits. Minor anti-malarial temporary measures.
Pulau Brani	...	Anti-malarial, scavenging, etc. Company had dispensary.
Pulau Bukom Besar	...	Scavenging provided by Company.

CHAPTER FIFTEEN

SCHOOL HEALTH

WHILE the need for more and more schools was partly relieved by the completion of many regional schools, the acute shortage of doctors and nurses as well as the lack of suitable buildings for use as school clinics, has inevitably limited the scope and extent of the School Medical Service. Inevitably also, the necessity for maintaining other equally important Health Services which moreover the Department is under a legal obligation to undertake, depleted further an altogether inadequate staff for this purpose during the first half of 1951. Happily, this situation improved during the latter part of the year under review when three more Lady Health Officers and one Health Officer became available. Of the former, one, because of her experience, is in charge of the new school tuberculosis service and the B.C.G. inoculation campaign. The training of a number of teams for the latter work also claimed much of the time of the staff.

So it was not surprising that fewer children were covered in the routine medical examination in schools than in 1950. The best that could be done was to examine newcomers and school-leavers and trust to the good sense of the teachers in the various schools to refer ailing children to the school clinics. This trust was shown to be not misplaced as 9,239 children were seen in the clinics, necessitating a total attendance of 24,699. The actual number of school children covered by the school health staff, both in routine and special examinations, totalled 62,548. By the end of the year, six medical officers and nine nurses were concentrated on this work for the first time and a much greater volume of effort will result in 1952. Very particular attention was paid to tuberculosis in school children however, and action in this connection was increased considerably in consequence.

The immediate staffing difficulty is not the only problem. The Education Department is expanding very rapidly and the number of school children is increasing by leaps and bounds. Even the staff shown in the estimates will soon be insufficient to cope with the number of school children in need of examination and subsequent treatment. Certainly the number of nurses, hospital assistants and clinical assistants will have to be increased year by year to meet the demand.

Apart from the staff, it is also necessary to have buildings in which to work. A well designed school medical and dental clinic centre is an urgent requirement in Singapore today, and the sooner the Medical Plan is implemented in this respect the better. The idea is a centralised organisation to which children can be transported as required to save staff and accommodation. Otherwise, the time of highly paid personnel cannot be kept to reasonable proportions under existing conditions in this connection. It is inevitable of course that as the Colony develops some smaller school clinics will be needed in other parts of the Island. In some of the more populous areas a combination of school clinic, dental clinic, maternity and child welfare centre and out-door dispensary will be required. At the moment medical clinics are held at North Canal Road, Paya Lebar and Teluk Kurau and dental clinics at the Tan Tock Seng Hospital. The North Canal Road Clinic is far too small to cope with the large numbers of children seeking medical attention. Plans are now being finalised for a modern centrally situated school and dental clinic which

will also offer ample facilities for a tuberculosis clinic and B.C.G. immunisation as a part of a large Urban Health Centre staffed by Government, City and University.

The inadequacies both in staff and in buildings noted above are serious, for whilst their effects may not be immediately apparent they will show in the coming generations of adults—the important factor.

There are at present 526 registered schools in Singapore. Afternoon schools are held in the same premises as many of the morning schools. These schools can be classified as follows:—

<i>Govt. and Govt. Aided Schools</i>				<i>No. of Schools</i>	<i>Enrolment</i>
English	...	...	...	99	48,349
Malay	...	...	...	43	8,505
Chinese	...	...	...	80	45,542
Indian	...	...	...	20	1,272
Junior Trade School	...	...	...	1	167
Sub Total				243	103,835
<i>Private Schools</i>					
English	...	...	...	33	6,296
Chinese	...	...	...	208	30,432
Miscellaneous	...	...	...	42	6,879
Grand Total				526	147,442

Almost all the Government and Government-aided English Schools and Malay Vernacular Schools were covered by examination during the year. The large number of Chinese aided schools cannot be examined yearly with the staff available but an endeavour is made to have these covered every two or three years. As most of the Government schools except new entrants have been fully examined since 1947 only the first two primary classes and the two senior classes (those about to leave school) were included in the routine examination. Any child in the intermediate classes, however, who needed a health check, was seen. The principals of these schools were most co-operative. The large majority of the children examined were found to be in reasonably good health.

The term 'English School' may be misleading to the non-Malayan. Such a school is not meant for the reception of English children, but is a school in which the medium of instruction is the English language. It is open to all races and creeds.

The new regional schools are bringing in a section of the child population which has hitherto received little or no state medical assistance, and there is a tendency for these children to show a much poorer state of general health than those dealt with in the past. This fact has a bearing on the present and certainly on future comparative rates. That a majority of them come from the lower income groups will reflect on our figures for tuberculosis.

Nevertheless the improvements observed in the descending general morbidity and mortality rates were also reflected in the health of the children examined. Reasonably good health was seen in more than 90 per cent of boys (86 per cent in 1950) and 71 per cent of girls (75 per cent in 1950). There is reason to believe however, that the health of girls is in fact better than the rate quoted above implies. Staff turn-over was abnormally great and personal variability in the assessment of physical health—mental hygiene has yet to be initiated in schools—has certainly been the main reason for this comparatively low rate: but the state of general health of girls can be said to be of a lower order than that of boys. It is still a deplorable fact that in certain communities the boy is given a deliberate advantage over his sister in education and in nutrition.

Vaccination

The school health service had in the previous years a hospital assistant to carry out re-vaccinations in schools. At the beginning of the year he was transferred to serve in the floating dispensary, and re-vaccinations are now performed by school health nurses. By the end of the year action was in hand for an intensive re-vaccination campaign in all schools.

Skin Condition

Considerable improvement was noticed in the skin condition of both boys and girls. While 22.38 per cent of girls and 11.74 per cent of boys had some form of skin disease in 1950, these percentages have dwindled to 8.8 per cent and 10.36 per cent for girls and boys respectively in 1951. Scabies is still very prevalent but even in this case there has been notable improvement. Nits were observed in 11.21 per cent of girls. There is also a belief in some sections of the community that the presence of these vermin is a sign of the continuing favour of the Goddess of Fortune! Scabies and head lice are of course a measure of the general conditions prevailing in the home. It is not much good trying to control these conditions in schools whilst the children are exposed to constant re-infection in their own houses. To obtain lasting results it would be necessary to visit homes in all cases and treat the family as a whole. Fortunately modern methods of treatment make these conditions less alarming than formerly.

Worm Infestations

Quite a proportion of school children show some signs of worm infestation. This is again a condition which is never ending unless the problem is attacked from the home. A child living in insanitary surroundings is exposed to constant re-infestation and the elimination of worms by treatment becomes a temporary measure which needs frequent repetition. In some schools many of the children do not wear shoes and so re-infection is encouraged. It is not that the children do not wish to wear shoes or that their parents do not want them to do so. They just cannot afford to buy such articles at present prices in many instances.

Seventy-three per cent of the children needing actual treatment for worms are from the rural areas, and it is significant that 67 per cent were covered by the travelling dispensary of the school medical service, which reaches only those areas which are not at convenient distances from the school clinics. Our archaic methods of disposal of night-soil in the rural districts cannot but encourage the prevalence of helmenthiasis.

Eyesight Defects

On the information available the eyesight of the school children of Singapore can be said to be generally good as only 3.95 per cent of girls and 1.31 per cent of boys examined had visual defects. Where the rough examination possible in the school or school clinic reveals a real defect of vision the child is referred to a qualified optician, and when the parents are unable to pay the Education Department gives financial assistance. Eye conditions requiring advice and treatment from an Ophthalmic Surgeon are referred to the Eye Department at the General Hospital. Fortunately such conditions are not very common.

Anæmia

Attention has been drawn to the variability of physical assessment owing to the rapid turn-over in the medical staff of the girls' section. Even in the

case of anæmia this has now become evident. 4.15 per cent of girls and 10.85 per cent of boys seen were found to have under 60 per cent haemoglobin in their blood as indicated by the talquist method of estimation. This difference is the reverse of what might be expected when it is remembered that girls tend to lead a more sheltered life than boys and so are the less liable to worm infestation, and that more girls than boys tend to leave school at the age of twelve, an age above which anæmia tends to be more common in girls. It must be remembered however that routine school examinations were confined to new-comers and school-leavers so that the impact of sheltered groups cannot be excessive.

Bone and Joint Condition

Three cases of tuberculosis of the spine, eight with cleft palate and 197 children with postural defects were referred to the Specialist at the General Hospital for treatment.

INFECTIOUS DISEASES IN SCHOOLS

Chicken Pox

662 cases of chicken pox were investigated as against 253 in 1950. The disease itself is not dangerous but it is very necessary to make certain that the case is not one of small-pox. If it were not for this danger, chicken pox would attract very little attention.

Measles

462 cases were investigated (59 in 1950). The danger from this disease lies in its complications. Pneumonia is however not such a frequent complication in children of school age here as in many other countries.

Mumps

451 cases of mumps in school children were investigated during the year. This is a troublesome disease from the educational point of view because of the long quarantine period of three weeks. It is necessary to limit the spread as far as possible by keeping the patients away from school until they have recovered. Mention of certain rare disablements which may follow from an attack of mumps generally results in local parents giving full co-operation although it is not legally notifiable as an infectious disease.

Whooping Cough

Only 4 cases of this disease occurred in school children (29 in 1950). Whooping cough is not an important condition in the school age child here and is a nuisance rather than a danger. General immunisation of young children was not practised by the Government Health Department because there is doubt as to the lasting effect of the immunity conferred and because of the poliomyelitis present over recent years.

Diphtheria

Fifty-six cases were notified from amongst the children of school age i.e. 56 out of 147,442 school children. This figure compares with twenty-eight cases out of 132,565 school children in 1950. While admittedly this figure is still low, there has been a definite general increase in the number of cases. While cases tend to be sporadic many are often severe which suggests that numbers of mild infections may not come to the notice of the medical practitioner. A proper scientific investigation of the prevalence of this disease and the value of the schick test in this climate is called for before we can be definite as to how much diphtheria there is in Singapore.

Typhoid Fever

There were thirteen cases of typhoid notified. These were from different schools and occurred at different times, and at no time was there any suggestion of an epidemic state.

Leprosy

Only one case of leprosy was observed in the school children of the Colony during the year as against 24 cases in 1950.

It will be observed that there has been an increase in those infections of prosodemic and respiratory spread. Particularly has this been so in the case of mumps, measles and chicken pox. Since the liberation, owing to the shortage of schools, it has been the practice to hold afternoon sessions in most schools. Further, a number of new regional schools have appeared. The holding of two sessions in schools with hardly any interval between sessions would certainly favour the spread of respiratory infections. These factors may explain the increase in these diseases.

TUBERCULOSIS IN SCHOOLS

In dealing with tuberculosis in schools the method adopted has been firstly to start from the known case coming from a school, either pupil or teacher, and to investigate all contacts by all possible means; secondly to offer B.C.G. inoculation on a voluntary basis to all tuberculin negative children. So the figures and rates arising from these investigations cannot be regarded as indicating any true picture of the prevalence of the disease in school children or otherwise. They merely indicate the general trend and give some idea of incidence. Until the staffing position improves sampling methods cannot be attempted. All the factors that can favour and maintain a high rate of prevalence of the disease are present in Singapore, but these vary from area to area, from social class to social class and from occupation to occupation.

The reports which set the machinery of school investigation in motion issue from the School health officers and nurses, from the Tan Tock Seng Hospital Almoners' staff and from health visitors. Mass X-raying of the school children and the teachers concerned, is the rule, or class X-raying, or skin testing with tuberculin. Positive results are then investigated further. The Singapore Anti-Tuberculosis Association (S.A.T.A.) has rendered very valuable assistance in this X-raying technique and in reporting results.

SCHOOL CHILDREN X-RAYED—BOYS AND GIRLS

—		Numbers examined radio- logically	Numbers with Pulmonary Tuberculosis present radiologically	PRIMARY COMPLEX		RE-INFECTION		Post Primary
				Active	Healed	Active	Healed	
1951	..	5,434	315	125	118	66 (1.2%)	6	..
1950	..	5,819	532	192	282	49 (0.8%)	9	..
1949	..	3,174	281	100	17	51 (1.6%)	7	1
1948	..	596 (only)	..	..	..	..	..	..

SCHOOL TEACHERS X-RAYED

The survey on teachers started in 1949 was completed to the following extent:—

	Number examined radio- logically	Ab- normal films	TOTAL ACTIVE CASES		Total arrested	Total still under observ- ation	Percent- age active
			Sputum positive	Sputum negative			
Males ..	1,005	54	3	14	} 81	8	1.7
Females ..	1,234	94	5	21		9	2.1
Total ..	2,239	148	8	35	81	17	1.9

The results of the 1951 X-ray of children and of their further investigation and assessment were as follows:—

Nothing abnormal detected	...	...	...	4,656
A. Active adult type Tuberculosis with positive sputum	...	...	...	20
B. Active adult type Tuberculosis with negative sputum	...	...	...	46
C. Inactive or arrested Tuberculosis	...	...	...	6
D. Active primary complex	...	...	...	125
E. Healed primary complex	...	...	...	118
F. Tuberculosis of the spine	...	...	...	3
Bronchiectasis	...	...	...	18
Other findings (not tuberculosis)	...	...	...	252
Pneumonitis	...	...	...	37
Under observation (not assessed)	...	...	...	152
Pleurisy	...	...	...	1
Total	...	...	...	5,434

A., B. and F. total sixty-nine cases and comprise those which show tuberculosis in the way ordinarily understood by laymen. The age distribution of those with positive sputum was as follows:—

Age in years	Boys	Girls	Total
8	1	0	1
14	1	1	2
16	4	1	5
17	1	0	1
18	5	2	7
19	1	1	2
20	1	0	1
21	1	0	1
Total	15	5	20

It will be seen that of the 20 sputum positive cases 19 were in teen-agers and that the age group most affected was between 16 to 18 years. During the previous year 9 such cases were recorded. These findings, even if of limited value, have a public health significance, since these children will be leaving school soon to earn a living or to go on to higher studies. Of the 14,423 children X-rayed over the last three years 170 or 1.2 per cent turned out to be active with 0.3 per cent with positive sputum. A finding of 1.2 per cent of adult type tuberculosis with a quarter of them actively disseminating the mycobacterium cannot leave room for complacency.

C. (6 cases) are those who have had tuberculosis, but in these cases the disease has healed. Whether this healing will go on to a permanent cure depends largely on the stresses and strains to which these young people may be subjected in their future life.

D. In any area where tuberculosis is a common disease children must sooner or later come in contact with its germs. This applies to most parts of the world. A few of these germs settle in the upper part of one or other lung and the surrounding tissues react to their presence. In the large majority of cases an immunity develops and the child is left with a relatively lasting resistance to further small infections. The reaction of the tissues is beneficial and is called a primary complex. It is closely related to the immunising of persons against infectious diseases by vaccination or inoculation.

E. This figure relates to those children who have had a primary complex as in D. and in whom the reaction has died away. It is, as it were, a vaccination scar which will gradually become less and less apparent.

TREATMENT

School children requiring active treatment for tuberculosis are under the care of the Tuberculosis Specialist at Tan Tock Seng Hospital. Many are admitted, but where circumstances and financial considerations permit, the children are treated at home.

TUBERCULOSIS DOMICILIARY FEEDING SCHEME

The tuberculosis 'feeding scheme clinic' continued to be held at the North Canal Road and the Paya Lebar school clinics. The purpose of this scheme is to give extra food to those children with active primary complex who live in poor homes and whose parents cannot afford to give them the kind of food necessary to ensure that the child shall make a complete recovery and not go on to becoming an actual case of tuberculosis. A majority of those fed showed this tendency to tuberculosis: others, because they were either tuberculosis contacts or were in such a poor state of physical health as to favour the appearance of the disease in them, were also included in the scheme. In the normal child the primary complex generally causes no apparent effect but in the under-nourished and the over-taxed ill health may be observed during this period. Extra food and extra care are essential in such cases.

The extra food provided weekly consisted of:—

12 eggs.	8 oranges.
$\frac{3}{4}$ lb. vitaminised margarine.	5 large spoonfuls of ovaltine.
1 lb. dried milk.	2 cigarette tinsfull of peanuts or groundnuts.

A total of 227 children were on the tuberculosis feeding scheme, 37 of them being carry-overs from 1950. By the end of the year definite improvement was observed in 110 while 117 were still under observation.

During the year skimmed milk powder was available free of charge from U.N.I.C.E.F., and was substituted for dried whole milk powder. To make it more palatable, ovaltine was purchased to mix with it and make it acceptable to local taste. The importance of additional protein in the diet in such cases cannot be overstressed.

There is a danger of such a scheme being abused by poor parents to augment income at the expense of the child's health. All homes where children receive food are visited regularly by the health visitors and it is pleasing to be able to state that no case of selling of the food provided has been discovered so far.

Another difficulty which is encountered in homes where there are other children is that the food tends to be shared, so that the intended recipients

do not get the full benefit. In consequence where the primary complex is associated with a known case of tuberculosis all the children living together are taken on to the feeding list as a preventive measure. Only 13 had to be added in this connection during 1951—so that from the practical and economic point of view the procedure adopted is workable.

A further difficulty is the securing of adequate rest for the child with a primary complex, and this is particularly difficult in the case of girls. The Chinese girl is expected to assist her mother and to look after her younger brothers and sisters. Unless she is too ill to be up and about a full day's work is expected from her. Also an overcrowded shop house is not an ideal place for rest and fresh air. It is often preferable for children of this environment to continue to go to school as they can live a more restful life in this way than by remaining at home. The need for a true 'rest home' for sick children in some country place beside the sea cannot be too greatly stressed. Here is the ideal opportunity for voluntary assistance to be undertaken on a large scale.

It is difficult to assess the benefits of such feeding schemes as this. The children are weighed at regular intervals but there is insufficient data available as to the normal weightage curves of Asian children in normal health and with adequate food. Even in countries where vast numbers of data have been accumulated and studied it has been found almost impossible to work out a satisfactory graph that could be used as a working model because of the variability of observation. An increase in weight due to age may yet be below the normal increase to be expected over the same period. In others it may express a definite improvement. Physical examination and re-X-ray can show when the primary complex has healed. Extra food and rest constitute a very sound method of treatment with the bed shortages in institutions which must continue to exist. So the scheme will be continued. It allows for 100 children to be dealt with at any time and 227 children were on the feeding list during the year. Each child was given a full examination every third week and in all cases concurrent diseases such as worms, scabies, etc. were treated. Cod liver oil is given as an addition to the extra food in all cases.

The following table gives a resume of those on the feeding scheme:—

TUBERCULOSIS DOMICILARY FEEDING SCHEME

Type of Case	Number definitely improved	Number still under observation	Total
Primary Complex ...	46	46	92
Tuberculosis of the Spine ...	—	4	4 (1 from 1950)
Minimal lesion ...	1	3	4 (1 from 1950)
Pneumonitis ...	16	4	20 (1 from 1950)
Adult type ...	4	3	7 (1 from 1949)
Basal bronchiectasis ...	1	3	4
Very poor house condition ...	—	—	—
Pleurisy and plural thickening	8	1	9
Heart (very poor house) ...	—	2	2
Healed primary (P.T. contact)	5	2	7
Opacities follow up ...	17	27	44
Opacities and check of (P.T. contact) ...	5	15	20
P.T. contact in poor circumstances but N.A.D. ...	7	5	12
Cervical Adenitis ...	—	1	1
Malnutrition (P.T. contact) ...	—	1	1
Total ...	110	117	227

THE SCHOOL CLINICS

There are three school clinics in operation in Singapore. These treat children referred to the clinic as a result of school inspection, and children sent by headmasters and headmistresses for medical attention. For reasons beyond the control of the Department these clinics have to do far more work than a school clinic should and are in fact out-patient departments for children of school age. However most of the cases seen would receive little or no attention if it were not for the out-patient function performed.

The main clinic is at North Canal Road. It is a small cramped building liable to be flooded when heavy rain coincides with a high tide. This clinic is open on Monday, Wednesday, Friday and Saturday in the morning, and on all days except Saturday and Sunday in the afternoon. On Thursday morning the tuberculosis feeding scheme operates from here. Paya Lebar Outdoor Dispensary is used as a school clinic on Monday and Friday afternoons. The clinic at Teluk Kurau is held in a small room in the Teluk Kurau English School building. It is open on Tuesday afternoons. Serious cases seen at the two smaller clinics are referred to North Canal Road for complete examination and treatment.

NUMBER OF CASES SEEN AT CLINICS

		<i>New Cases</i>	<i>Re-visits</i>	<i>Total Attendance</i>
North Canal Road ...	...	7,556	12,617	20,173
Paya Lebar ...	...	1,232	1,961	3,193
Teluk Kurau ...	...	451	882	1,333
Total ...		<u>9,239</u>	<u>15,460</u>	<u>24,699</u>

The North Canal Road school clinic laboratory carried out 49 blood films examinations, 1,248 other blood tests, 1,120 stools examinations and 348 other examinations. In the stools examinations ankylostoma ova were evident in 126 specimens while round worm ova were found in 229 specimens only (20.45%) out of the 1,120 specimens examined. Of the 149 blood films, 3 showed malaria parasites.

THE SCHOOL TRAVELLING DISPENSARY

It was possible to extend the scope and functions of the School Health Service when a School Travelling Dispensary became available in March. It was placed in the charge of a health nurse and visited rural schools not at a convenient distance from the school clinics for the treatment of minor ailments. Altogether 12,189 school children were seen and treated, mainly for pediculosis, helmenthiasis and skin diseases.

SANITARY REPORTS ON SCHOOL PREMISES

In addition to the eighteen new Government Regional Schools and seven non-Government Schools completed in 1950, eight new Government Schools and seven non-Government Schools commenced to function during the year. Besides these, six domestic dwellings were converted for use as schools. Many schools are still running morning and afternoon sessions.

Eleven plans for new school buildings and twenty-two for additions and alterations to existing school buildings were dealt with and approved. Twenty-four proposed new premises were recommended for registration as schools while three were rejected on grounds of unsuitability.

Regular inspections of all existing schools were carried out in order to ensure, and where necessary, to enforce reasonable sanitary conditions. Defects and nuisances observed were reported with recommendations to the Education Department for action. During the year the School sanitary inspector made 453 inspections of school premises (306 Chinese Schools, 80 English Schools, 27 Malay Schools and 40 Indian and other schools).

SCHOOL TUCKSHOPS

A feature of the schools of Singapore is the number of hawkers who congregate round the gates of each during the intervals and when the children are leaving to return home. These hawkers sell various sweetmeats and drinks which, although they appeal to the taste of the children, have little to recommend them to the Health Officer in either their method of preparation, or in the manner in which they are exposed for sale. The situation is aggravated by the fact that many of the children leave home in the early morning without having eaten an adequate meal. By the interval they are really hungry and the hawker finds a ready sale for his goods. So persistent are these hawkers that in some places they even place themselves on the verandahs outside the classrooms and only the threat of force, with the power to implement it, can evict them from the school premises. Nevertheless, these individuals are a menace to the child health of Singapore.

For a child to come to school in the morning without an adequate meal is most undesirable, the lowered vitality due to hunger favouring the spread of disease and seriously affecting the capacity of the child to benefit from the instruction received. So the provision of properly conducted school tuckshops where wholesome articles of food and drink can be provided during intervals is very important. These exist in some of the better run schools, but even so the competition from the hawker without the gate must be ruinous. Proper drinking fountains should be provided wherever the presence of a pipe water supply permits.

SUPPLEMENTARY FEEDING FOR SCHOOL CHILDREN

As in previous years the greater part of any supplementary feeding for children has been conducted by the Social Welfare Department at 'Feeding Centres' now called Children's Social Centres. While these centres do not cater for the school child as such, they supply the need of those children who ordinarily do not go to school, and in addition to the provision of meals, simple education classes are also conducted in them. During the year 1,376 school children in 13 schools were given a total of 419,380 feeds.

Dr. S. Kiani, L.M.S. (Singapore): D.C.H. (London) was in charge of the School Health Division during the year.

CHAPTER SIXTEEN

DENTAL HEALTH

A LITTLE over three years ago the Colony had no public dental service, except for such treatment of the general public as could be provided—quite secondarily to the instruction of students—at the Dental School of the College of Medicine. With the establishment of the University and the separation of the Medical and Dental Schools from the Government Medical Department there arose a demand for a Government dental service. Early developments have been concentrated on a service for school children as a first priority. A Chief Dental Officer was appointed in 1951 to plan a steady expansion on these foundations.

Caries and other dental affections are among the most prevalent of all diseases, but because they are only mildly crippling and because they can be largely relieved by the easy course of extracting—and sometimes replacing the affected teeth, they receive far less attention than they should.

In order to provide a complete scheme of conservative dentistry a very large operative staff would be required. The usual figure for calculation is that each dentist can maintain in health some 2,000 to 3,000 patients. On this basis Singapore requires at least 400 dentists today. It is true that there are about 300 dentists on the register, but most of them are unqualified, and in any case the economic circumstances of the majority of the population preclude their receiving dental treatment from private practitioners.

With the limited accommodation resources at present available it has been decided to continue to concentrate on the treatment of children, on the basis that caries is largely a disease of youth, and that the logical way to approach the problem is to give the child a good start rather than attempt to repair the ravages in the adult.

It is usual the world over to start treatment when the child first goes to school at about the age of six. In this country at least this is not thought to be early enough. Inadequate diet and incorrect feeding habits have often caused irreparable damage by the time the child is six. Some way will have to be found in due course to reach and treat the child at an earlier age when the eruption of the first dentition is completed. Such a scheme of course is far from easy to devise. A start may be possible by persuading mothers to bring the children for treatment at the Infant Welfare Clinics.

Other groups of persons have begun to call for dental attention, and the idea of Government, as an employer, providing at least a partial service for its employees is beginning to receive attention. Plans are afoot to provide some such service.

As a disciplined force, the maintenance of whose health is of recognized importance, the Police have a special claim in this respect, and for just over a year a Dental Officer has been operating at Police Headquarters. During 1951 he examined and treated 1,132 patients. Treatment was completed for 283 of them: 1,325 fillings were inserted, and 1,165 extractions carried out. The Gurkha Contingent readily accepted full treatment, but there were many refusals among the Malay rank and file. The position in this respect will probably improve when the long-awaited Dental Clinic can be built and properly equipped. The Malayan Naval Force is now following the example of the Police in employing a full time Dental Officer.

Regular dental treatment was given at the Woodbridge Hospital, mainly by the Chief Dental Officer, with the object of removing sources of focal infection and thus assisting in the relief or cure of mental disorders. The time must come when every hospital in the Colony includes a comprehensive dental service for all its in-patients.

The Inspecting Officer to the Dental Board made 522 inspections at the premises of 269 registered dentists during the year. Reports of conditions prevailing and recommendations for their improvement were made to the Board. A number of complaints were investigated, including four cases of alleged 'covering' of unregistered dentists. A beginning was made in checking the display of unsuitable signboards and other forms of advertising.

These activities are all well enough in their way, but the enormous expense of providing full treatment for all who need it, and the large number of Dental Officers required must lead to a search for other means of attacking the problem. In the Federation the idea is being developed of using Dental Nurses to treat school children; Singapore too is sending girls for training in the Federation as Dental Nurses for service in the local schools. This promises a swifter and more economical approach to the question of dealing with the school child, and it may be found later that these ancillary workers can handle the pre-school child also.

The question of prophylaxis must be brought into greater prominence. Although the cause of dental caries has not yet been determined, there are a number of prophylactic measures which have been shown to reduce its incidence. These are:—

- (1) reducing the intake of sugar and other refined carbohydrates, especially between meals;
- (2) thorough tooth brushing within ten minutes of each meal.
- (3) the addition of anti-enzymes in food or drinks to hinder the formation of lactic acid from carbohydrates in the mouth;
- (4) strengthening the resistance of the tooth by the application of fluorides to the surface;
- (5) ensuring an adequate and balanced diet for the expectant mother and the growing child.

Nos. (1) and (2) involve a profound change in the habits of the population, and it is doubtful whether this can be brought about, even after many years of education and propaganda. No. (5) offers more hope; the Health Division is already doing a great deal in this direction, but again a drastic change in feeding habits is required and this will not be achieved very easily. Nos. (3) and (4) both occur in nature where there are adequate quantities of fluorine in the drinking water, i.e. 1 part per million or more. Where less fluorine than this is present, fluorides can be added, and many towns in Canada and the United States have already had some years of experience of fluoridation schemes, with marked success in the reduction of the incidence of caries. Enquiries have been set afoot to discover whether such a scheme is possible in Singapore. It must be made clear that this would not eliminate the disease entirely, but it could provide a simple and comparatively inexpensive way of reducing its incidence and lessening the time and money required to treat it in the mouth.

SCHOOL DENTAL SERVICE

Dental care and treatment for school children continued to be carried out in the Tan Tock Seng Hospital in a ward converted into a temporary Dental Clinic for up to six dental officers. Up to the end of September the clinic was staffed by four dental officers, but in October one officer proceeded on long leave.

The selection of children for treatment was as follows:—Approximately 2,000 in Government and Government-aided schools per officer are selected and given dental treatment. These children are then re-examined and treated again in the following year. It was noticed that the average child attending the school clinic for the first time usually shows evidence of gross dental neglect and therefore requires a disproportionate amount of treatment. Because of this it was not possible to give complete treatment to all the selected children during the first year. A programme of systematic treatment has, however, been worked out and put into practice.

While a lot of leeway has to be made up before full attention to all children becomes a reality, considering the fact that this service began only in 1949, the expansion it has been able to record both in staff and in quality and quantity of work performed during so brief an interval is particularly encouraging.

In the schools 5,959 were examined. Of these, 5,165 (86.7 per cent) required attention. By the end of the year treatment had been completed in 3,931 cases. Follow-up examination of children attended to the previous year showed that little more was needed to maintain their dental health, one visit usually sufficing for this. In addition some 3,279 children were referred by the School Health Officers for emergency treatment, mainly extractions of temporary teeth. It is true that this is not conservative dentistry, but it has been repeatedly shown that the elimination of oral sepsis in this way is of great value to the health of the growing child. The total number of fillings for the year was 14,107. Extractions of deciduous teeth numbered 6,461 and of permanent teeth 1,719.

Chief Dental Officer: Mr. N. H. Gittins, F.D.S., R.C.S.

(Report on Dental Clinic will be found under Chapter Eighteen.)

CHAPTER SEVENTEEN

THE SINGAPORE ADVISORY COUNCIL ON NUTRITION

DURING the year 1951 the Nutrition Council decided that the formality of its position should be defined and to this end a constitution was drafted and submitted to Government for approval. Henceforth the Council will be known as the Singapore Advisory Council on Nutrition with the functions 'of reporting to the Government on nutritional questions submitted to it by Government, and of volunteering information and advice on nutritional problems which may not have been submitted but which, in the opinion of Council, may merit the attention of Government.' The Council will have the power 'to make all legitimate enquiries and to recommend to Government the appointment of persons or bodies for the purposes of obtaining information.'

Professor J. H. Strahan acted as Chairman of the Council until May 1951 when during his absence from the Colony on leave, Dr. Vickers was appointed the Acting Chairman.

The Council discussed a number of problems throughout the year concerning the health of the population as a whole as well as of particular groups. As cereals, primarily rice and secondarily wheat, are the most important constituents of an Asian diet, the Council reviewed the evidence, relating the quality of foodstuffs to the standard of health. The Government policy prior to 1950 resulted in the importation of undermilled rice and the incidence of beri-beri had markedly decreased in the Colony. Since 1950, the rice has been highly milled and the intake of Vitamin B₁ considerably lowered so that many people are thought to be on a borderline level of intake in this respect. It was considered that adverse circumstances such as decreased prosperity or other emergency would cause a deterioration in health, particularly in the lower income groups. The Council drew the attention of Government to the desirability of measures for the improvement of the nutritive value of rice and recommended that suitable plant and materials be purchased for the large scale enrichment of rice and other staple foodstuffs in an emergency.

In order to protect the public regarding claims for enrichment, the Council submitted to the Sale of Food and Drugs Committee standards of enrichment of wheat, bread and flour, to be incorporated in the regulations appertaining to the Sale of Food and Drugs Ordinance.

The Council continued to act in an advisory capacity to the Department of Social Welfare with regard to the Child Feeding Scheme. The supplementary meal supplied in 1950 consisted of a piece of fresh fruit, a drink made from skimmed milk with added vitamins and cocoa, and a 2 oz. bun prepared from flour enriched with thiamin, riboflavin and iron. The cost of cocoa had risen markedly during the year with the result that the cocoa-vitamin addition to the milk would be 41 per cent of the total cost of the meal. It was recommended that cheaper flavouring substances such as weak coffee be used to replace the cocoa and a trial feeding experiment showed that this would be acceptable to the children. The money saved by this substitution is to be used for the provision of a 3 oz. bun with the same level of enrichment as that formerly supplied by the 2 oz. bun.

In June 1951 the Press gave considerable publicity to some patients admitted to the General Hospital, Singapore, suffering from malnutrition. The Nutrition Unit, Department of Social Medicine and Public Health, University

of Malaya, investigated and reported on these to the Council, which decided that some form of family disaster such as illness resulting in unemployment had affected the family adversely in these instances: that the malnutrition was not the direct result of an insufficiently high fixed wage: it had no direct bearing on the nutritional state of the community. Nevertheless the Council recommended that steps should be taken to reduce the margin between the cost of landed imported foods and the retail prices, and that a major publicity drive should be directed to induce people to change their feeding habits by consuming those foods which cost less but are not less nutritious. The Council decided that under the prevailing conditions of high prices and high population level, the lower paid workers with large dependent families are in danger of being unable to supply the minimum adequate nutritional needs of themselves and their families, and therefore consideration should be given to expanding the Child Feeding Scheme particularly to members of large families.

The Council was informed that an investigation had been conducted by the Department of Social Medicine and Public Health, University of Malaya, into the health of a group of rural Chinese families. The survey revealed that there was a high percentage of hookworm infestation, together with a low percentage of hæmoglobin and some evidence of vitamin deficiency in this community. In view of the fact that after the survey had been completed, this area had recovered considerably from the effect of floods in 1950, the Council considered that special relief was no longer necessary.

Throughout the year copies of the minutes of the meetings of the Council were distributed to similar bodies working in other countries in the Pacific area and also to the representatives of the international bodies of W.H.O. and F.A.O. This contact is of great value and has resulted in an exchange of ideas and information regarding the nutritional problems which are the subject of investigation throughout the area.

Miss Jean Millis was the Secretary of the Council throughout the year.

THE NUTRITION UNIT

In 1951 the Nutrition Unit, Department of Social Medicine and Public Health, University of Malaya, was able to devote its time to the problem of growth rates of infants in the Colony. A study of the record cards of infants attending health clinics showed that many were unsuitable for use in the construction of curves for 'normal' infants, as these records revealed that attendance was irregular and that the children required medical treatment for some illness which undoubtedly retarded their progress. Weight-age curves were constructed for infants in the rural area, but it was decided that additional material should be collected for the urban area. With the co-operation of the Kandang Kerbau Maternity Hospital, mothers of babies classified as full term and normal were contacted on discharge from the wards. 250 Chinese and Indian mothers, formerly third class patients and living in the urban area, are visited regularly by the Unit. The group was carefully selected in order that the sample would be representative of the whole population with regard to age and parity of the mother and occupation of the father. The babies are weighed and measured and records are kept of all the conditions which may influence the health of the child. Details of housing, income, the number of dependants in the family, any undesirable social customs, the feeding of the baby together with any history of illness, are noted for correlation with the progress of the infant.

The Unit is measuring the height and weight of 170 Chinese pre-school children in the areas in which the statistics of infant growth are collected. Measurements are made every three months on the older children.

A study has been undertaken to find evidence relating nutritional status to fertility, and the outcome of pregnancy with particular reference to the years 1947 and 1950. There is no evidence that suboptimal nutrition has decreased fertility in this country, but the figures for deaths in the first week of life suggest that nutrition during pregnancy does influence the viability of the new-born baby. The average birth weight of Chinese and Indian babies born in 1947 was significantly lower than that of the babies born in 1950, indicating that the maternal nutrition was less adequate in 1947. In 1950 the babies born to women in the higher income groups were heavier than those from the lower income groups. A report of this study is being prepared for publication.

As in previous years the Nutrition Unit has investigated families in the urban and rural areas for the purpose of undergraduate teaching of medical students. The additional responsibilities of the Unit to the University of Malaya has caused some curtailment of other activities and it will become more necessary to limit these activities as the teaching requirements become more arduous. The need for more trained workers in this field is evident to all people associated with public health work, and until sufficient qualified staff is available progress in this field will be retarded.

In spite of the difficulties of fitting emergency projects into a full-time programme the Unit continued to assist Government Departments during 1951. Members of the Division continued to advise in particular in regard to the Child Feeding Scheme and the adequacy of patient's and staff diets in the urban hospitals. Investigations were taken to determine the causes of malnutrition in 34 children admitted to the Eye Clinic of the General Hospital suffering from Vitamin A deficiency. These visits provide opportunities for instruction of the mother in better feeding and hygiene for the family. Cases of financial hardship are referred to the Almoner, General Hospital, for assistance. As shown previously, investigations were made into cases of malnutrition in adult male patients in the General Hospital. This information was required for a more general enquiry into the effect of the cost of living on the health of the population.

The Nutrition Unit co-operated with the Food Consumers' Association in providing a nutrition section in the public exhibition held in Singapore in October, and for this purpose the staff of the Department of Social Medicine and Public Health assisted by preparing posters and models of foodstuffs. The aim of the exhibits was to increase the consumption of locally produced foods of high nutritive value. An opportunity for general education on the use of a more varied diet was also created.

PART III
THE HOSPITALS DIVISION

CHAPTER EIGHTEEN

THE HOSPITALS DIVISION

GENERAL REVIEW

THE graphs which accompany the next chapter give some indication of the steady increase in the number of in-patients and out-patients treated at the General Hospital over the last four years. This picture is common to all our medical institutions as the following table clearly shows:—

MAIN HOSPITAL PATIENTS

—				In-patients	Out-patients Attendances
1938	...	...	...	25,913	87,447
1947	...	...	...	27,514	258,917
1949	...	...	...	32,998	380,599
1951	...	...	...	40,833	562,449

Post-war the Medical Department was faced with the alternative either to restrict the number of patients treated in accordance with accepted standards determined by the staff and facilities available or to accept all patients in need of medical attention. It is to the credit of the Department that the first alternative was never seriously considered and that our staff responded to the call of suffering humanity and endeavoured to meet the challenge in spite of the handicap of no increase in accommodation and no comparable increase in staff. It must be admitted that the acceptance of the Medical Plan in principle created the impression that the difficulties facing the Department would only be of a temporary nature and that as year succeeded each year these difficulties would gradually diminish, until in a short time our hospital facilities would be sufficient, and the Colony of Singapore would have a medical service adequate for the needs of its community. Unfortunately this hope has not been realised. Action on the Medical Plan only began to take real shape towards the end of 1951. In consequence the staff, in attempting to cope with a problem really beyond its capacity, has often been subjected to ill-considered criticism. Such criticism under such circumstances, with the hope of improvement continually deferred, could easily have engendered a feeling of frustration and of pessimism leading to a serious fall in morale. That this has not been the case is a credit to the personnel concerned. So the results of the laying of the foundation stone of the new Nurses Home and the new Out-patient Division at the General Hospital on 11th December, 1951, by His Excellency the Governor in the presence of the Right Honourable the Secretary of State for the Colonies on the staff can well be imagined. It is felt that the Department is getting somewhere at long last. The hospital services were known to be extremely outmoded before the war and Sir Richard Needham severely criticised the existing organisation as long ago as 1934 and again in 1939. He particularly underlined the lack of any proper

out-patient system. In consequence the need for the Plan devised in 1946/1947 and finally accepted by the Legislative Council in 1948 cannot be overstressed. What is intended has been summarised in Chapter One already.

Apart from the work that has been started at the General Hospital under the scheme, plans were in process of finalisation for modernising and bringing the Maternity and Women's Diseases Hospital to 350 beds and for completing the first stage of the 300-bedded Sanatorium at South Winds. The second stage of the Leper Settlement Scheme is expected to be ready for occupation by February of next year, when it is also hoped to occupy the new Base Medical Stores and Manufactory adjacent to the General Hospital.

Owing to the delay in the implementation of the Plan attention had to be turned again to bringing the existing General Hospital standard to its most effective maximum at the earliest moment. Thus the Hospitals Board asked the Senior Staff Committee to reconsider the decision to limit the total bed strength at this institution to 850. The idea is now to increase this to a maximum to 1,000 as it is thought that this can be done fairly early.

The lack of buildings detailed under the Plan for the existing hospitals proper has made conditions even more difficult for all departments as attendances have exceeded all previous yearly records. While it can be claimed that in general the present facilities compare more than favourably with those existing pre-war, it is realised that most departments are not properly housed and equipped to cope adequately with the demands now made upon them. More accommodation is a very urgent necessity and until new buildings are available very little can be done to improve the present state of affairs.

Reference to figures of in-patients and out-patients will reveal the fact that the demands on the hospitals have been greater than ever before in every department and the extra work has called for more nurses, thus absorbing the very small gain in the total strength of nurses over the year. An all out drive for nurses cannot be initiated, however, until provision is made for nurses hostels. As it is, ward space and borrowed houses have had to be reserved for this purpose to keep the present recruiting scheme in operation.

During the year more new graduates from the Medical School were absorbed into the teaching hospitals to undergo their housemanship of one year, and they came as a very necessary and welcome relief. The medical staffing is in consequence more satisfactory in the junior ranks, but the hospitals are still suffering seriously from the lack of medical officers of *experience*, and of officers of specialist grades. The lack of living accommodation for the medical staff continues to be a serious problem.

The very limited progress made on the Medical Plan during 1951 was disappointing but the Estimates approved for 1952 give rise to the hope that there will soon be a substantial improvement in the position. During the year it was decided not to expand the present General and Women's Hospitals to the contemplated 1,500 and 588 beds respectively, but merely to extend to a maximum of 1,000 beds at the former, and 350 beds at the latter, developing instead a further scheme in another part of the town to comprise three blocks of a new institution housing general, children, and women's diseases and maternity sections to a total of some 750 beds.

Out-patient clinics of all kinds must play a very important part in the future development of the hospitals. It is now realised that large, adequate, and well equipped out-patient departments with modern effective new medicines can enable the hospitals to treat large numbers of patients instead of admitting them into wards. So in hospital development the building of out-patient departments must have a high priority indeed. Only staff quarters can claim precedence over them.

Such divisions as almoners and physiotherapists and occupational therapists were considered to be the dream of a visionary before the war. Today no hospital service can expect to function without such specialised organisations. That we have created such departments at long last is creditable, but rapid expansion under the Medical Plan is an urgent necessity.

The medical services of all countries are now a very important part of the administration, and increasingly so with the widespread activities of the World Health Organisation, since the recent war. Many representatives from this Organisation have visited the hospitals and health centres of Singapore during the year. Many medical men, administrators and workers in the social field, in addition, have inspected our activities.

AVAILABLE BED STRENGTH OF VARIOUS GOVERNMENT HOSPITALS

	Pre-war	1946	1947	1948	1949	1950	1951.
General	750	550	550	600	700	700	750*
Kandang Kerbau (excluding cots) ..	180	200	220	240	240	240	240†
Tan Tock Seng	600	400	400	550	572	600	540‡
Orthopædic .. .. .	..	60	60	60	65	70	70
Prisons	140	50	50	118	118	140	140
Social Hygiene (excluding cots) ..	Part of General	60	60	60	68	70	70
Infectious disease	250	250	250	250	250	250	250
Leper Settlement	200	260	347	382	451	536	640
Police Training School	20	20	20	20	20	20	20
Mental	2,000	440	700	1,000	1,200	1,600	1,800

NOTE ON NON-GOVERNMENT HOSPITALS

The following institutions provide beds for the public:—

Kwong Wai Siu Free Hospital (Chinese) ...	350 beds
St. Andrew's Mission Hospital (Children) ...	30 beds
Malayan Union Mission of Seventh-Day Adventists ...	24 beds
Hainanese Hospital ...	20 beds
Kheh Hospital ...	30 beds

The first two of the above are run entirely for the poor, and the Kwong Wai Siu caters for both Chinese and Western forms of medicine.

* Under present conditions these figures mean overcrowding.

† This figure is chronically exceeded as a reference to the particular section of the report concerned clearly indicates.

‡ A reduction in available beds through use of wards for staff quarters.

MAINTENANCE CHARGES OF THE MAIN HOSPITALS (DAILY AVERAGE)

	Paying Patients (a)	Paying Patients (b)	Free Patients
	\$ c.	\$ c.	\$ c.
GENERAL HOSPITAL			
Maintenance including diet ...	18 34	16 97	15 58
(Diet only)	3 93	2 56	1 26)
KANDANG KERBAU HOSPITAL			
Maintenance including diet ...	12 36	11 54	9 72
TAN TOCK SENG HOSPITAL			
Maintenance including diet ...	—	—	9 29
SOCIAL HYGIENE HOSPITAL			
Maintenance including diet ...	—	—	8 47

YEARLY IN-PATIENT RETURNS

	Paying	Free	Total
General	2,726	17,568	20,294
Kandang Kerbau	2,017	16,078	18,095
Tan Tock Seng	—	1,849	1,849
Social Hygiene	—	2,676	2,676
Middleton Hospital	—	2,317	2,317
Orthopædic	—	138	138
Total ...	4,743	40,626	45,369

Excluding mental and leprosy cases, out of a total number of 45,369 cases treated in Singapore's acute hospitals 40,626 or 90 per cent were free. All leprosy cases are treated free of charge also. In regard to mental disease over 90 per cent at any one time are free cases.

There is an Ambulance Advisory Committee which sits as and when required to review the Colony's requirements in this respect. The following is the present position which is considered to be sufficient for present demands:—

General Hospital	4 in use and one due to arrive.
Kandang Kerbau	2 in use.
Tan Tock Seng	2 in use.
Middleton Hospital	2 in use.
Fire Brigade Accident Service ...	1 in use.
Rural Board	1 in use and one provided for in the estimates.

CHAPTER NINETEEN

THE GENERAL HOSPITAL

THE General Hospital remains the only acute hospital for medical and surgical cases (excluding gynæcology) in the Colony of Singapore. The basic bed strength was raised to 670 by the opening up of a further children's ward. The daily number of patients in 1951 has exceeded this number on many occasions however and lately by overcrowding has even reached 750 from time to time.

Lack of adequate facilities for the nursing and care of the chronic sick and infirm has resulted in quite a number of such cases remaining in the hospital for prolonged periods. This is a problem which calls for early solution.

It is hoped that the bed strength of the General Hospital will in the not too distant future be increased from the present basic to 1,000. With this end in view a determined recruiting drive for suitable girls for our Nurses Training School was launched towards the end of the year. The response was most encouraging as 17 male and 47 female probationers joined the new course, but with it came the problem of providing accommodation for the ladies. It was found necessary to turn two of the hospital wards into dormitories. Another ward is at present not used for housing the recently qualified housemen. Thus it is clear that staff accommodation has become the pressing priority. December is always the best month for the nursing recruiting drive as the students complete their school year then. There is no doubt that the intake in December 1951 could have been considerably increased if accommodation had been available. As this is the first time nursing candidates have come forward in real numbers it is a tragic pity that the Medical Plan had not reached the stage to take advantage of this situation. In consequence it is intended to take on new recruits in future as they apply instead of at stated intervals. A candidate who applies today may not be available tomorrow. These are unsatisfactory temporary solutions.

At the present time there are three Surgical and two Medical Units, with one Ear, Nose and Throat, one Ophthalmic, and one Pediatric Unit.

This hospital is used as the main teaching institution for medical and dental students and is the training school for nurses.

During the year much further new equipment was acquired and this added greatly to the efficiency of the Units in the investigation and treatment of patients. When the contemplated extension has been completed, many special divisions such as radiology and dermatology will be better distributed and organised. These have to be run on a more or less day-to-day basis at present.

The training school for nurses acquired additional equipment for teaching and it is hoped to purchase a sound film unit early next year. The value of the latter was apparent by the interest and enthusiasm shown by the nurses in the education nursing films made available by the kindness of the United States Information Service and the British Council. Each of these organisations proved invaluable in this and other directions during the year.

1951 saw the resources of the hospital taxed to the uttermost in dealing with out-patients and in-patients and both showed an increase over any previous year. The following tables are of interest in this respect:—

Out-patients			New Cases	Repetitions	Total Attendances
1947	...	...	40,496	73,671	114,167
1949	...	...	45,966	107,568	153,534
1950	...	...	53,811	108,713	162,524
1951	...	...	59,576	125,555	185,131

In addition, the Medical Officer-in-Charge of Officials dealt with special cases as follows:—

—		1949	1950	1951
Examination of candidates for Government service ...	...	2,544	3,361	6,514
Inoculations and vaccinations ...	...	855	970	1,165
Medical Boards ...	...	108	85	119
Total ...		3,507	4,416	7,798

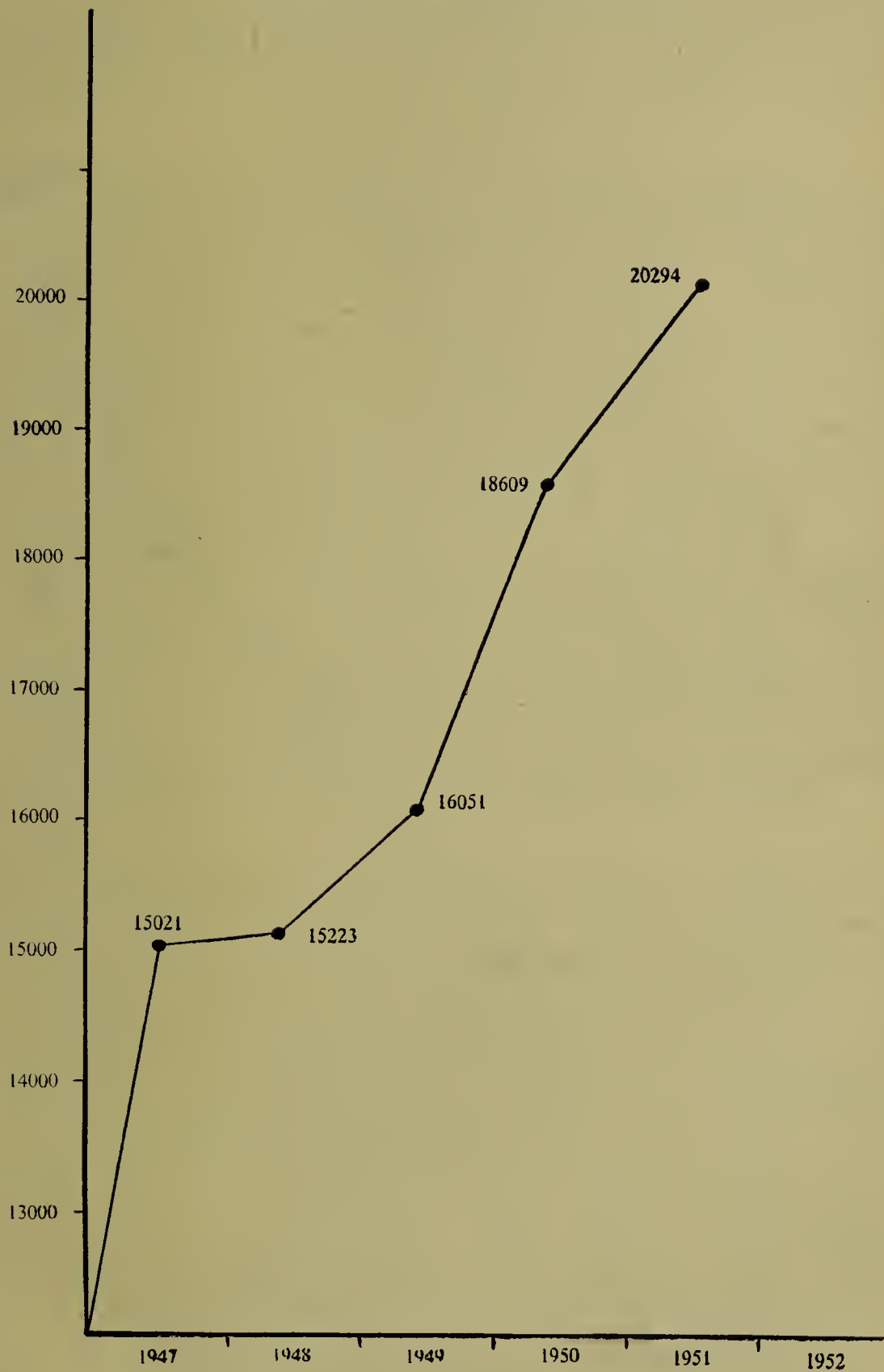
In-patients			Daily Average	Male	Female	Total	Deaths per cent
1949	...	...	607	11,357	4,700	16,051	12.5
1950	...	...	642	13,080	5,529	18,609	12.75
1951	...	...	670	14,329	5,965	20,294	11.56

The marked increase in the daily average number of patients reveals the serious overcrowding of wards that was a feature of the year and a constant strain on the staff when it is remembered that the duration of stay in hospital was again reduced to a minimum.

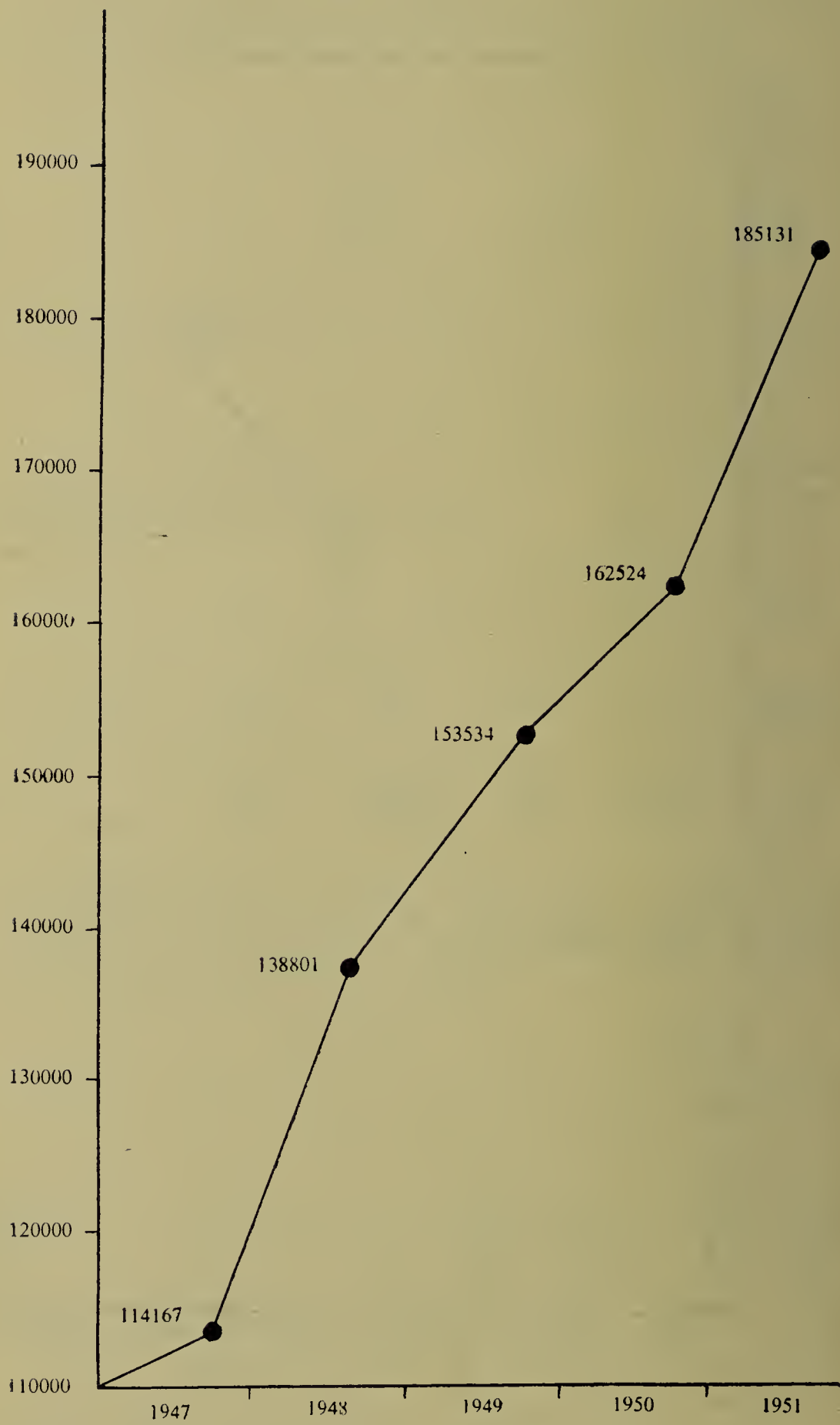
Nationalities		NEW CASES				REPETITIONS			
		Male	Female	Child	Total	Male	Female	Child	Total
Europeans	..	1,104	658	382	2,144	2,520	1,540	1,036	5,096
Eurasians	..	608	268	185	1,061	1,032	802	471	2,305
Chinese	..	20,163	9,338	7,375	36,876	42,545	20,810	17,400	80,755
Indians	..	9,139	1,937	2,295	13,371	16,760	3,086	4,469	24,315
Malays	..	3,356	748	766	4,870	7,267	1,807	1,747	10,821
Javanese	..	655	127	105	887	408	317	211	936
Others	..	182	121	64	367	395	510	422	1,327
Total	..	35,207	13,197	11,172	59,576	70,927	28,872	25,756	125,555

The graphs on pages 103 and 104 show a steady increase in in-patients and out-patients over the past five years.

TOTAL NUMBER OF IN-PATIENTS TREATED



TOTAL NUMBER OF OUT-PATIENTS TREATED



As more staff becomes available, so improvements in various directions are steadily attempted. Thus for the first time it became possible towards the end of the year to completely re-organise the out-patient department within the limits of the unsuitable accommodation available. The new out-patients division should be ready early in 1953. It will then be possible to give the public a much better service in this vital connection.

THE MEDICAL UNITS

There are three separate Medical Units providing accommodation for some 258 patients, one of these being for the care of sick children. While a further ward was added to the Children's Unit during the year bringing this section to 90 beds, accommodation in all three Units continued to be seriously overtaxed and all medical wards were chronically overcrowded with emergency beds filling verandahs or aisles. It can be imagined how difficult such conditions are for the ordinary medical and nursing staffs, particularly during the periodic emergency 'take-in' periods. When the large number of students is added, the conditions sometimes become really onerous. The effort to admit all cases requiring attention has continued however and teaching facilities have been extended to both medical and dental students. While more and more beds are required for medical cases, there is no doubt that the new and modern out-patient division soon to be built will help considerably in this connection. The Department of Social Medicine continued to investigate the socio-economic background of selected cases. The extended Almoner Division was able to help in the removal of the large number of chronic cases which still occupy valuable ward space although more of these were transferred to the Tan Tock Seng Hospital. On the therapeutic side all the newer drugs were made available and were used on an ever-increasing scale, with increasingly satisfactory results. This necessitated a very considerable increase in the drug votes for 1951 as compared with any previous year. There were no special features regarding the general run of the adult diseases dealt with.

In the case of the children total mortality continued to be approximately a third although there was a reduction in the number of deaths recorded within 24 hours from 621 to 471. This points to an earlier admission of cases of grave illness, an encouraging sign. Nevertheless the high general mortality in the children's wards is due to the large number of cases not given appropriate care until it is too late. Many enter the hospital in a moribund state. There were 2,720 admissions during the year. The principal diseases in order of frequency were: gastro-enteritis, broncho-pneumonia, nazo-pharyngitis, tuberculous meningitis and bronchitis. The principal causes of death were gastro-enteritis, broncho-pneumonia and tuberculous meningitis. Acute gastro-enteritis and broncho-pneumonia accounted for almost half the admissions and over half the deaths. Dr. Haridas reports that 142 cases of tuberculous meningitis were observed in children during the year. Of these, 112 died before any effective treatment was possible. Of 29 who received intrathecal and intramuscular streptomycin and para-aminosalicylic acid by the mouth five have left hospital and eight are still under treatment. Of the five, only one is really well. Two are mentally deficient and one is going downhill. This fatal disease has not responded well to anti-biotics here.

The interesting decrease in cases of tetanus neonatorum reported on last year in a paper by Dr. Low Siew Gek continued. Only 22 cases came into hospital in 1951 as compared with 36 in 1950 and three times that number four years ago. This is thought to have some bearing on the improved maternity and child welfare services.

Of the 480 medical cases admitted for police observation some 300 had to be transferred to the mental hospital and some 70 had nothing wrong with them. Of 18 attempted suicides only 6 were due to caustic soda.

Professor E. S. Monteiro, the Professor of Clinical Medicine, reports as follows on his Unit:—

During the year the Unit purchased a photometer which will be required for research work in anaemias and also a Cambridge unipolar lead apparatus for use with the Cambridge electrocardiograph for routine and research work on unipolar limb and chest leads. The new Philips Metalix X'ray plant, which has just been installed, is giving excellent service and has proved of great value in teaching and research. A new cinematograph screen has been installed in the lecture theatre for the bi-monthly screen of medical films of educational value. This has proved very popular with the graduates and the undergraduates.

RESEARCH

The following research is in progress:—

The anaemias of Singapore—A survey of the incidence and type of anaemias commonly met with in Singapore and a study of their aetiology and treatment.

The use of hexamethonium and pentamethonium bromide and hexamethonium bitartrate in hypertension—This work is still in progress and several schemes of dosage are being tried. The bromide salts have resulted in certain side reactions which are objected to by some patients and the bitartrate salts are being used.

Artane in Parkinsonism—This is still in progress and to date only six cases have been investigated from this point of view. The results are encouraging in a disease which causes so much disability.

The following investigations have been completed:—

The incidence, pathology and social pathology of rheumatic heart disease in Singapore—This was successfully submitted as a major thesis for the M.D. (Malaya) by the author. In a work which took nearly four years to complete, Rheumatic Heart Disease was studied from the point of view of its clinical features, natural history, social pathology and morbid anatomy. One hundred and fifty cases of established valvular disease of the heart were studied and fifty-eight early cases of rheumatic heart disease were studied and followed from the commencement of illness to the fully developed picture of Valvular rheumatic heart disease. The investigation also analysed the four years autopsy records of rheumatic heart disease in Singapore.

Liver biopsy as a means of diagnosing disease of the liver—A work which was successfully submitted as thesis minor for the M.D. (Malaya) by Dr. Khoo Oon Teik. It records the results of an investigation of sixty-eight cases of liver disease by aspiration biopsy by a technique which was successfully developed after patient research in the Unit.

Chloromycetin as a therapeutic agent in typhoid fever—Work on this has just ended with the publication of a paper in the British Medical Journal, Malaya Branch. In this work the effect of chloromycetin was studied in typhoid fever following the initial experience Smadel et al. Several schemes of dosage were tried. It was found that the average case of severe type of typhoid fever requires about 28 G of chloromycetin spread over two weeks and the dosage which we have found to be less tedious and less complicated is an initial loading dose of 500 mg. followed by 250 mg. three hourly for the next two weeks. On this scheme of dosage the temperature fell to normal in three days and the morbidity was shortened to a week compared with an average of thirty-five days fever and morbidity in the mild cases not receiving any chloromycetin.

The use of aminopterin in acute leukaemia—Four cases of acute leukaemia were treated with aminopterin, one of the folic acid antagonists. Aminopterin reduces the peripheral blood counts in cases of leukaemia, but certain uncontrollable actions of aminopterin, like prolonged haemorrhages and ulcerations of the mouth make its use undesirable in leukaemia. Further trials are necessary with aminopterin and other folic acid antagonists.

Cortisone and A.C.T.H.—Four cases of rheumatoid arthritis are being treated with cortisone and or A.C.T.H. The investigation of such cases require the help of laboratory work and careful clinical assessment during treatment. Immediate improvement, both mental and physical, and immediate relapse with severe mental depression following withdrawal, have compelled us to caution in this investigation, especially as supplies of these agents are difficult to obtain.

General

Teaching of clinical medicine—practical and systematic theoretical instructions.

During the year one hundred and thirty students attended clinics of the Department of Clinical Medicine. This included 49 students in the 4th year, 52 in the 5th year, 29 in the 6th year. Classes were held right through the year as students are posted for clinical instructions even during the University vacation.

The Unit Out-patients' Department and Follow-up Clinic

The Unit Out-patients' Department and Follow-up Clinic are now in full operation where cases which cannot be treated in the wards because of acute shortage of beds are followed up and treated. Cases which require a constant check, and especially those which do not have their own medical attendant, attend for regular inspection. Attendances for the year have totalled 5,153 and this work is increasing."

Professor G. A. Ransome, the Professor of Medicine, reports that clinical studies are in progress in connection with coronary thrombosis, failed peritonema, and coma, the latter two by Dr. Gwee Ah Leng. He also reports that streptothrin graminaciæ was isolated from the first human case. Dr. Danaraj published a communication on 'severe hypertrophic osteoarthropathy' (Proceedings, Alumni Association, Volume 4, March 1951).

The record of work from the hospital's clinical medical laboratories is given in Appendix VIII and gives some idea of the numerous investigations undertaken.

Unit Chiefs:—

Professor G. A. Ransome, F.R.C.P., M.R.C.S.

Professor E. S. Monteiro, M.D., F.R.F.P., & S., M.R.C.P., D.C.H.

Dr. Gopal Haridas (Children), J.P., M.D., M.R.C.P.

THE SURGICAL UNITS

The surgical units again covered a surprising volume of work during the year when the total number of operations performed was 9,740, more or less the same as in 1950. This total compares with 6,828 in 1949 and 6,341 in 1947. However, major operative procedure which is now a daily routine increased, and over a third of the work can now be said to be in this class.

The scheme whereby newly qualified graduates were invited to become housemen for a year, and had to do this course if coming into the Government Service, was continued successfully. All applying were taken on but it will not be until July 1952 when some 50 candidates sit for the final that more than sufficient will be available. Again assistance from R.A.M.C. consultants was forthcoming and is gratefully recorded.

The Medical Plan only got into gear in regard to improved clinical facilities towards the end of 1951. So the following remarks by the Professor of Surgery, Professor D. E. C. Mekie are still relevant:—

It is tragically true that each Annual Report is a tale of struggle against odds. What has been done has been accomplished in spite of, rather than because of, the inadequacy of staff and facilities. It is right that in addition to submitting figures as a record of work done I should draw attention to the increasing gravity of the situation. The figures will reveal increasing numbers of patients admitted and operations performed. But this has been secured without any improvement in the accommodation facilities or increase in the staff.

There are three disabilities from which we suffer:—

1. The year 1951 opened with the work of the two professorial units still combined to secure concentration of staff and added efficiency. By April of this year it was possible to resume the more normal division of work with both 'A' and 'D' theatres working. It will be remembered that in 1950 and at the commencement of this year we had lost the services of Mr. Monro and Mr. Johns. At the beginning of this year, Mr. Falconer and Mr. Foster arrived to take up their duties as University appointees to the posts of Surgical Chief Assistants. Mr. G. S. Yeoh had already joined the hospital staff in 1950. Unfortunately Mr. Yeoh Bok Choon had to assume duties in Johore early this year and Mr. Foster left Singapore after only a brief period. There is thus to-day a smaller *senior* surgical staff than previously.

2. *Shortage of Facilities.* I have to draw attention to the lack of adequate theatre accommodation which exists.

3. *The difficulty of Imbalance.* A hospital may well be compared to a factory with a team of skilled workers. The efficiency of the factory will be reduced not only if there is a shortage of workers or machines but also if the ratio of the various grades of workers or types of machines is imperfect. So too in the hospital.

(a) *Beds.* In both 'A' and 'D' units the total number of beds is large by many standards for a surgical unit but many of these same beds are occupied by cases which should not be admitted to an acute surgical unit or not kept in such a unit. The alteration in the character of Tan Tock Seng Hospital from a chronic to a tuberculosis hospital has had the unfortunate repercussion that the place to which the case for which active surgical intervention is not possible or the case in the terminal stages of disease could be sent no longer exists. I have in my wards several cases which, having no home to go to, but still requiring some nursing care, must either be retained in the acute surgical wards or else be callously thrown out into the street to die.

It is to be hoped that the new out-patient department will reduce the present considerable number of minor cases which are admitted to the major units with minimal justification.

(b) *Theatre and other Facilities.* I have already referred to the shortage of theatre accommodation in 'A' unit. This is not only absolute: it is also relative. In this unit the availability of beds is relatively adequate. But the available theatre facilities prevent the beds being utilised fully. Like difficulties apply in 'D' theatre.

(c) *Imbalance of Staff and Facilities.* Largely as the result of the war there is a grave shortage of medical staff at the *important middle grade*. There are experienced surgeons in charge of units but there is lack of men who can rightly be called upon to undertake work which while it calls for skill and some experience does not demand the graver responsibility which should be borne by the consultant surgeon.

STATISTICS

The figures showing admissions and operations constitute the main index of the work done although there are many fallacies in such an index.

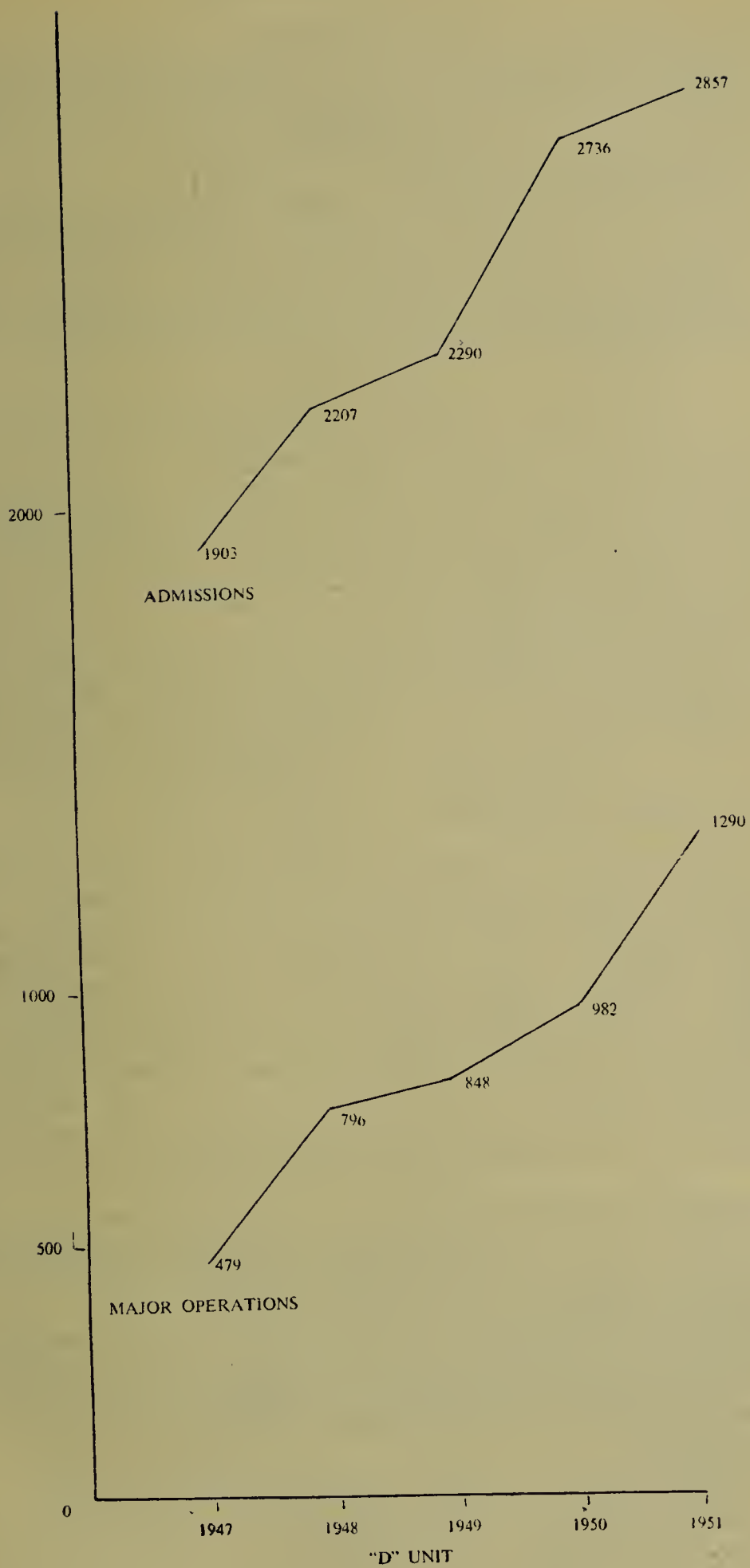
'A' unit, working as an independently admitting unit, re-opened on the 1st of April and to the date of making this report the total number of admissions has been 2,074—a monthly average of approximately 230 cases. The number of operations of major character has been 811 and minor cases 1,354. Total number of operations = 2,165.

The figures for 'D' unit covered by this report are 2,857 admissions. The total number of operations done was 4,254 of which 1,290 were major operations. Minor cases numbered 2,964.

The continued increase in cases of very major character to which attention has been drawn in previous reports continues. The thoracic surgery now undertaken during the past year is responsible for 141 operations while in the sphere of abdominal surgery the number of cases of peptic ulcer and gastric carcinoma requiring the very major operation of gastrectomy amounts to 33.

DEVELOPMENT

The re-opening of 'A' unit as a full and independently admitting unit at the commencement of April of this year afforded the opportunity to secure certain internal re-arrangements which have proved to be of very great value. I shall be taking over 'A' unit as my sole charge when 'D' unit becomes the Orthopædic and Traumatic unit under the charge of Professor J. A. P. Cameron,



and accordingly I have sought to incorporate in it certain facilities and staff arrangements which I have long desired. The first important feature has been the appointment of a unit sister whose co-ordinating work in connection with the distribution of nursing staff, the admission of patients, the arrangement of operating lists, and general supervision of the unit, is of utmost value. In addition of course she undertakes the supervision of actual cases when other sisters of the staff are off duty.

Further it has been possible to organize one half of ward 5 as a post-operative and resuscitation ward. The need for this has become more and more apparent as cases of considerable magnitude increase. It avails little to carry out an operation of a major character if by reason of inexpert or insufficient post-operative supervision and care, the patient dies. Accordingly the idea of concentrating these cases in one section of the unit and having there a maximum number of expert and senior nurses is one of great importance.

CONCLUSIONS

I wish to conclude this report by emphasising that the complaints with which it opened are not made in a peevish spirit nor without regard to the difficulties which exist for the administrators to meet the many demands which are made upon them. We have, I think, succeeded in continuing to carry on in spite of shortages of staff and changes in staff in a manner which at least is supported by the figures as indicating that we have not regressed. But I have voiced these complaints and difficulties because I felt it is my duty to point out that this steady upward trend of admissions and operations cannot be continued indefinitely without increasing the number of doctors and nurses, without provision for increased facilities.

The following work was carried out by the Surgical Unit under Mr. Vellasamy, and the Ear, Nose and Throat Unit under Mr. Au Kee Hock:

General Surgery	...	...	2,734 operations of which 337 were performed in the out-patient division.
	Admissions	...	4,067.
Ear, Nose and Throat	...	...	587 operations.
	Admissions	...	3,172.

It should be noted in connection with the above criticisms that action on the considerable scheme for properly designed operating theatres to replace two of the three existing theatre units had to be delayed owing to the magnitude of the general scheme involved and the urgent need for staff quarters and out-patient facilities as a first priority. When the two existing theatres in the old block next to the radiology division can be removed the radiology division particularly in the treatment field will be expanded to meet the ever-increasing present demand. The radiology division has been very considerably expanded and improved up to the limit of present accommodation. The nursing shortage is being steadily improved at the expense of ward space. No real advance in this respect can be contemplated until the new Nurses Home has been completed.

Considerable further improvements of a minor nature will have been achieved within the existing structure by the time this Report is out but real modernisation depends on the far reaching proposals outlined in the Medical Plan of which new theatre accommodation is a part.

The difficulty of building up a staff with inexperienced medical and nursing personnel has been mentioned elsewhere in this report. Nevertheless the position in regard to experienced surgeons will have improved somewhat in the new year by the appointment of two further senior officers.

Unit Chiefs:—

Professor D. E. C. Mekie, M.B., CH.B., F.R.C.S.E., F.I.C.S.

Mr. K. Vellasamy, L.M.S. (Singapore).

Mr. Au Kee Hock, L.M.S. (Singapore).

Mr. C. D. Falconer, M.B., CH.B., F.R.C.S.E.

ANÆSTHESIA

Dr. E. G. Hudson, M.R.C.S., L.R.C.P., D.A., the Senior Anæsthetist reports as follows:—

ESTABLISHMENT

There is an Establishment for five Anæsthetists in Singapore. At the present time there are four full time anæsthetists. It is hoped in the near future to recruit one further anæsthetist.

TEACHING

An important feature of the anæsthetic service is the training of medical officers and medical students in anæsthesia. This not only helps to relieve the shortage of full time anæsthetists here in Singapore but ensures that medical officers posted to other duties will have some knowledge of the subject. At the present time the anæsthetist situation in the Federation is desperate and every effort is being made here in Singapore to remedy this.

GENERAL ANÆSTHESIA

The majority of major operations are performed under this type of anæsthesia, spinal anæsthesia in most cases only being used when the services of an anæsthetist are not available. For operations requiring muscular relaxation the modern technique of a light general anæsthetic combined with a muscle relaxant is invariably used. Decamethonium iodide, d-tubo-curarine chloride, and flaxedil are the relaxants in daily use in the operating theatres. Endotracheal and controlled respiration techniques are used for all major thoracotomies and for many upper abdominal operations. Modern anæsthetic techniques are a great advance on the older methods and without them many operations are either impossible or extremely risky procedures. It must be emphasised that the anæsthetist requires considerable skill and experience and we are concentrating on giving preliminary training to the students and more advanced training to the medical officers of the Surgical Division.

Below is given an analysis of the major anæsthetic procedure in the three operating theatres at the General Hospital and the theatre at Kandang Kerbau Hospital during the year 1951:—

TYPE OF ANÆSTHETIC

<i>Hospital</i>		<i>General</i>	<i>Spinal</i>	<i>Local</i>	<i>Total</i>
General					
Theatre A ...	...	1,594	12	504	2,110
Theatre B ...	...	1,103	368	1,025	2,496
Theatre D ...	...	1,626	64	944	2,634
Kandang Kerbau	...	2,075	11	7	2,093
				Total ...	9,333

OPHTHALMOLOGY

Dr. A. D. Williamson, M.B., CH.B., (Glas.), D.O.M.S., F.R.C.S.E., the head of the Ophthalmology Unit, reports as follows:—

During the latter part of 1951, the ophthalmic surgeon was on leave, and his senior assistant who had returned from the United Kingdom after obtaining a higher qualification was in charge. A further considerable increase in new out-patients and operations took place. An unprecedented number of students attended for clinical teaching and this is taxing resources considerably.

Epidemic kerato-conjunctivitis, described in last year's report, has been less frequent, as has also been keratomalacia.

Trachoma continues to become less prominent as an active condition.

The work of the Blind Advisory Committee during the past two years has culminated in the formation of a Society for Blind Welfare which has now been launched.

A refraction clinic for school children in limited numbers was begun early in the year.

RETURNS OF OPERATIONS FOR THE YEAR

Cataract extractions	...	...	...	...	353
Broad Iridectomy	...	...	...	...	34
Opitical Iridectomy	...	...	...	...	14
Iridotomy	...	...	...	...	2
Iris Inclusion	...	...	...	...	10
Excision of Prolapse Iris	...	...	...	...	12
Excision with purse string	...	...	...	...	1
Paracentesis	...	...	...	...	26
Needling	...	...	...	...	53
Diathermy for attachment of Retina	...	...	...	...	9
Squint operation	...	...	...	...	22
Trainor's operation	...	...	...	...	2
Toti's operation	...	...	...	...	14
Excision of Lach. Sac	...	...	...	...	4
Mucous Membrane Graft	...	...	...	...	34
Skin Grafting	...	...	...	...	16
Enucleation	...	...	...	...	41
Evisceration	...	...	...	...	9
Mc. Reynold's Operation	...	...	...	...	208
Foreign Body extractions	...	...	...	...	92
Foreign Body application of magnet	...	...	...	...	2
Tarsorrhaphy	...	...	...	...	7
Chalazion	...	...	...	...	188
Expression for Trachoma	...	...	...	...	172
Diathermy for vessels and corneal ulcer and eye lashes	...	...	...	...	241
Diathermy for Prolapse Iris	...	...	...	...	2
Application of Tonometer	...	...	...	...	9
Extenteration	...	...	...	...	1
Marginal Scleratomy	...	...	...	...	24
Cyclodialysis	...	...	...	...	4
Linear Extraction	...	...	...	...	8
Various	...	...	...	...	284
					<hr/> 1,898 <hr/>

The number of eye operations undertaken is again an increase over any previous year. (707 in 1948, 1,170 in 1949, 1,339 in 1950).

The up-to-date Ophthalmic division with its compact out-patient section and operating theatres completed in 1948 continued to prove its value. The extra accommodation is housed on one floor adjacent to its wards and forms a single unit which is probably the most modern and best equipped Ophthalmic Department in existence in this part of the world.

While only some 246 blind have so far been registered in Singapore it is certain that many more must exist. Of those registered 65 are under the age of six years, 53 between 6—15 years, and 99 over these ages. 29 are of unknown age. Nevertheless it is thought that the total number must be small for an eastern city. A start has been made through the Singapore Branch of the Red Cross and an Advisory Committee to give some specialised assistance, particularly in the field of reading and handicrafts. The inaugural meeting of an Association for the Blind was held on November 6th 1951 to co-ordinate work in this connection.

DERMATOLOGY

Dermatological conditions are naturally very prevalent in such a tropical climate as that of Singapore. Thus an effort was made to start a special clinic for this purpose at the General Hospital in 1950 in addition to that operating at the Venereal Diseases Hospital where quite a proportion of the cases tend to go in the first instance. Unfortunately under existing conditions it is impossible to provide much in the way of proper out-patient accommodation or beds for the purpose. Very severe cases are hospitalised of course but many who should be admitted cannot be accommodated at present. The new out-patient division which is now in process of building will be a great boon in connection with this division.

Major D. Gill of the R.A.M.C., took over the control of the Clinic from Major K. Greenwood on the latter's departure, and thanks are again due to the Army Medical Authority for this further instance of co-operation. A total of 8,223 patients were seen in the Skin Clinic during the year as compared with 7,776 in 1950.

LEPROSY

102 new cases were seen in the clinic. All cases are now referred to the Tan Tock Seng Hospital on diagnosis.

ECZEMA/DERMATITIS

This remained the largest group, with medication dermatitis amongst the Chinese as the largest sub-group.

SCABIES

The scabies clinic functioned on Friday afternoons only.

PYODERMA

Pyodermas, especially the ecthymatous type, and impetiginised eczema, were very common amongst the children attending the clinic. Modern antibiotics are very valuable in treating these cases under present conditions, with no accommodation for skilled dermatological treatment with cheap and simple remedies.

THE DENTAL CLINIC

A large part is played by the Dental Clinic at the General Hospital in the present small dental service of the Colony. This is under the supervision of the Professor of Dental Surgery (Dr. R. J. S. Tickle). He reports as follows:—

The Dental Clinic forms part of the teaching section of the Dental Department of the Faculty of Medicine, University of Malaya, and this report should be read in conjunction with the Annual Report of the University of Malaya.

The staff position has improved considerably during 1951. All vacancies for dental officers have now been filled, but it is expected that one officer will be transferred from the Dental Clinic, General Hospital in the near future. There are six vacancies for Dental Housemen but currently only one is filled. It is unlikely that other applications will be received before the examinations in June 1952.

With the appointment of Mr. N. H. Gittins, Chief Dental Officer, Singapore, the Professor of Dental Surgery has been relieved of certain Government administrative duties which he had previously been required to carry out.

Figures show that once again considerably more patients were admitted for treatment during 1951 than in 1950. This increase amounts to 1,279 patients or a 22 per cent rise, compared with an increase in 1950 over 1949 of 1,271 patients or a 28 per cent increase. These yearly increases are due principally to additional staff and students and cannot be expected to continue without extensions to the present Dental Clinic.

The demand for dental treatment is overwhelming, and a greater measure of treatment could be afforded to many dental cripples if space were available to properly accommodate the present large classes of students.

—	Chinese	Indians	Malays	Others	Total
Adults	3,191	885	654	190	4,920
Children	1,865	256	58	50	2,229
Total ...	5,056	1,141	712	240	7,149

DIETETICS

This is the second Annual Report of the Dietetic Division, but as the Department was without a Dietitian during the second half of the year because of illness, it is not a complete record of the work accomplished.

Early in June the dietitian left the country, and from then until the appointment of Mrs. N. A. W. Cessford (who is responsible for these notes) supervision had to be left to a Nursing Sister. As a result of the necessary change this work during the latter part of the year was directed more to the practical side than to the theoretical, with emphasis on the preparation of wholesome, well cooked meals and diets.

This target has necessitated:—

- (a) a general overhaul of the kitchen staff and its methods; and
- (b) continuous vigilance in inspection of supplies by food contractors, and ruthless rejection of goods and materials not up to requirements of quality and/or quantity. As the total sum involved in the purchase of groceries, meat, fish, eggs, fruit and vegetables etc. exceeded four hundred thousand dollars (\$400,000) in 1951, it will be realised that to ensure fulfilment of contracts it is necessary to exercise not only care but considerable mother wit.

The measure of success achieved, has been due in part to the forethought of previous years when kitchen equipment and the electrically heated food waggons were ordered, and to the response of the cooks, who have reacted in quite extraordinary fashion to the quality of the raw materials supplied to them.

It is fair comment to say that the staff of the kitchens, only two or three of whom read and write English, do very creditable work, particularly in connection with the complexities of special diets.

Daily visiting to ward patients has been carried out enabling close contact to be kept with the 'consumers' who have, in the main, been duly appreciative of their feeding and of the endeavours made to satisfy individual tastes where this is necessary.

The installation in the kitchens of gas-heated serving cabinets has enabled a re-arrangement to be made in the serving to ward staffs which has resulted in quicker service and tighter control.

Average number of patients served monthly:

(a) *Paying patients*

Adults	...	...	...	...	2,822
Special Diets	...	...	...	...	649
Total					3,471

(b) *Free patients*

Chinese	...	...	...	...	10,897
Malay	...	...	...	...	887
Southern Indian	...	...	...	...	2,204
Bengali	...	...	...	...	356
Punjabi	...	...	...	...	280
Special Diets	...	...	...	...	1,502
Total					16,126

(c) *Children—all free* 1,719

Average number of meals served from all kitchens daily = 1,768.

A very special attention was paid to the nurses' diets and constant action was taken to see that these were not only ample in quantity but fully nutritious. One of the difficulties in the latter respect is to provide enough calcium as those used to local forms of food are not in the habit of taking sufficient food articles high in this content. A real difficulty is to provide meals which do not get monotonous—a failing of all forms of institutional feeding and one which is the main cause of grumbling.

In the tropics where so much deficiency illness exists the dietitian finds the problems confronting her even more complex than in temperate countries, and in Malaya where so many different nationalities live, further complexities arise with the various racial and religious customs in the composition of diets and their cooking. In the General Hospital, for instance, there are various nationalities and religions represented in the cooks provided (Chinese, Sikh, Bengali, Tamil, Muslim) and these cook in separate kitchens and have separate types of food to prepare.

All kitchens are equipped with gas ovens, and large kualies in which rice is cooked by steam are additional to one section.

Of course all the kitchen arrangements in the hospital are quite out-of-date but to get any real improvement means major and very costly building and equipment changes. This is a part of the Medical Plan but unfortunately this improvement cannot receive an outstanding priority at the moment. The food supplied to all patients is plainly cooked and palatable. The extra cost to the paying patient lies mainly in the fact that extras are included.

One of the serious past difficulties has lain in the way of food transport from the kitchens, and so keeping the food reasonably hot until its arrival at the patient. The new electrically heated food trolleys now available have made a lot of difference, and additional ones are on order. Unfortunately such additions are very costly indeed.

The standard diets have been analysed and have been found to be adequate and of good quality though leaving some room for improvement in making the meals more attractive to patients. The main differences that have been made are in variety. There is a more frequent change of menus than previously and new dishes have been introduced. Many Asian patients prefer local foods so a special menu for them has been instituted. Apart from ensuring the adequacy of a diet as regards quantity and quality one must consider the likes and dislikes of patients and provide food that appeals to them so that it will be eaten.

The preparation and cooking of food have been improved but there is a great need for more widely experienced cooks to produce the desired results. Particular attention has been paid to the checking of raw food as regards the quality, and there appears to be room for improvement in this connection.

The use of fortified rice has been continued as it considerably improves the nutritive value by supplying additional Vitamin B and is satisfactorily taken by patients. It is difficult to measure the diet served by a pure nutritional standard as that widely accepted and recommended by the National Research Council (U.S.A.) is not completely applicable in this country. This problem has been discussed with the Nutrition Unit of the University of Malaya and much help has been given by this unit in finding out the dietary habits of the people of Singapore.

From visits to wards to see what patients actually eat, and from what is left on their plates, it seems that most of them eat their meals well and some have second helpings. Regarding the type of food—there are so many racial and individual ways of cooking and flavouring in patients' own homes and their meals include so many 'side' dishes that hospital food does not and cannot appeal as much as home cooked meals.

The present feeding scale for free patients is (weights given are raw food as purchased):—

Fish	...	...	...	4 oz.
Meat or	...	...	...	4 oz.
Eggs (2 oz. approx.)	...	...	...	1 duck egg.
Rice	...	...	...	8 oz.
Vegetable	...	...	...	6 oz.
Fruit	...	...	...	one serving about $\frac{1}{2}$ oz.
Margarine	...	...	...	$\frac{1}{2}$ oz.
Bread	...	...	...	4 oz. or more.
Jam	...	...	...	about $\frac{1}{3}$ to $\frac{1}{2}$ oz.
Sugar	...	...	...	about $1\frac{1}{2}$ to 2 oz.
Seasonings	...	...	...	according to community or race.

The free patients' meal routine consists of:—

Morning—Tea with milk and sugar; 2 ounces bread with margarine and jam.

Tiffin (11 a.m.)—Fish with rice and vegetable; fresh fruit one serving.

Dinner (4 p.m.)—Meat or omelette, with rice and vegetable.

Supper (7 p.m.)—Cocoa or ovaltine with milk; 2 ounces bread with margarine and jam.

Special diets:—

					<i>Average per day</i>
Paying (a) and (b)	...	...	...	...	18
Free	...	...	...	...	78

Attention has been paid to making special diets effective by keeping contact with patients and with medical and nursing staffs to see that:—

(a) food sent from the kitchen is taken by the patients;

(b) that the whole diet regime of these patients is scheduled and carried out.

It has been possible to make special diets individualised to some extent by making ward visits, but the large number involved renders such visits only practicable to those patients who particularly require individual diet therapy. An attempt has been made to instruct patients leaving hospital on special diets, and as the medical and nursing staff become more aware of the services of a dietitian more patients are referred to her. Twenty-nine in-patient diabetics have been instructed on the particular diet required as well as many cases of gastric ulcer and nephritis.



A typical Medical Ward, General Hospital

Public Relations



Children's Ward, General Hospital

Public Relations



Public Relations

Part of Kitchens, General Hospital

Out-patient Diets—Out-patients who require instruction are referred to the dietitian and in cases of poverty such patients have been sent to the Almoner who has arranged necessary financial aid so that they may continue diet treatment at home.

One of the present needs is for the establishment of a diet clinic to provide a regular centre at which patients can attend and where a proper follow-up can be initiated. This will need an expansion in the dietetics division however.

Number of Dietitians—Owing to the size of the hospitals and the number of in-patients and out-patients, more trained dietitians are necessary to cope with this important work. Although vacancies exist for dietitians there has been difficulty in obtaining competent recruits. It now seems that the only possible solution is to train suitable local graduates locally when the present trained staff is sufficient, and then send them abroad for further training. A dietitian's training in the United Kingdom takes some four years to complete, a science degree at a University with a special subject being necessary, followed by one year at a hospital which has a training course for dietitians. At the satisfactory completion of this course a certificate or diploma in dietetics is issued. Possibly the University may be able to institute a suitable course to this end in due course. A lecturer in nutrition has recently been appointed and this should help considerably in the arrangement of a suitable course. The year's special training in dietetics could possibly be established at this hospital.

The dietetics division is merely in a stage of development in Singapore and until further qualified staff is available it will be impossible to expand sufficiently the work of this very important speciality. As it plays such a vital and essential part in the treatment of the sick it must be extended to all our hospitals however.

THE ALMONER

The Almoner (Miss K. J. Eastaugh) comments as follows:—

The work in the Almoner's Department in the General Hospital has made steady progress during the past year and has continued on the lines established in the previous two years. It was unfortunate that the additional staff which has been agreed to in the Estimates could not be made available until late in the year because this has prevented the opening up of new sections in the Out-patient Department and the Surgical Units. Many more patients could have been interviewed and helped and this would have resulted in a considerable extension of the present work. The development of medico-social work is very dependent upon the co-operation received from the medical and nursing staff and this in turn is dependent upon their knowledge of the work itself. It has been apparent that direct personal contact with the doctors and nurses who are responsible for the treatment of the patient is essential because they are not yet fully aware of the fact that the help which it is possible to give to the individual is dependent upon the patients' own background, nationality, personal effort and the prognosis. Neither is there a full appreciation of the necessity to give the Almoner a completely accurate report on the patients' capabilities, and the tendency has been to overlook certain serious aspects of the disease in an effort to clear the beds for more patients. Only by personal contact can this be overcome plus a more intensive effort in the training of the staff to interpret disease and disablement into terms of a patient's life outside the hospital wards. However the number of new patients referred to the Almoner has been 100 per month and the diversity of the problems and the increasing numbers make it necessary to give even more intensive study to the facilities available for the sick and disabled in the community.

Individual case-work has been done for all the patients referred but because of the degree of distress suffered by them and their relatives most of this work has been directed to relieve the immediate need. With the increasing numbers however the Almoner finds that the charities, residential homes, and voluntary

agencies have already been stretched to capacity and for certain categories of patients there have been no facilities at all. It is therefore equally important to take a long term view of the need and to work for the establishment and development of new organisations to help certain patients.

Reference has been made in the two previous annual reports to the efforts being made to rehabilitate the disabled person into employment. Practical work has now started at the Labour Department and the hospital is about to refer ten patients a month for training grants and re-placement into suitable jobs. These numbers will increase when more experience has been gained in assessing the type of disablements which are most suitable for absorption into certain trades and industries. Although the Almoner is serving on the Technical Selection Committee and is the liaison between the doctor, patient and the Labour Officers, the final responsibility now rests with the Labour Department, and the Almoner would like to express her thanks for the interest shown by this Department in this new and important work.

A great deal of work has been done for children of all ages. Many have been admitted suffering from undernourishment due to neglect, and intensive work has been done on the families of these patients. Undernourishment has been due to both poverty and ignorance and in the first the Almoner has endeavoured to raise the family income. When ignorance has been the major factor the Almoner has called on skilled home visitors to teach the mothers how to buy the best food and how to prepare it.

It has not been so difficult to obtain practical help for the children living within City limits. The houses are easier to find, and there are Children's Social Centres and Creches where children can be left while the mothers undertake some remunerative employment. Those living in the rural areas have been far more difficult to help, the standard of living on the whole is lower and the parents have limited occupations. There were many more obstacles also in raising the standard of living for the families in the rural areas. When more remunerative employment was obtained they were faced with increased travelling expenses which destroyed any advantage gained from the added income. Most voluntary agencies have been willing to do home visits to the over-populated areas but have been reluctant to go to the more distant homes. Another difficulty has been to encourage the volunteers to work in co-operation with the hospital staff and not to decide on forms of treatment for disabled children against the staff's recommendations with a resulting loss of confidence by the parents. The Almoner thinks that in due course it would prove advantageous to use an Almoner in conjunction with the Rural Health Matron in the Rural Welfare Clinics to eliminate many economic and social problems on the spot before deterioration of health necessitates admission to hospital.

Children suffering from congenital deformities seem to have appeared in greater numbers and increasing attention has been paid to those suffering from anterior-poliomyelitis. There has been a great effort to put the children into various surgical appliances as soon as possible. This has so far been successful but the Almoner has experienced some delay in obtaining these appliances. A special vote in future estimates will help to solve this difficulty.

Many of the children attend the McNair Road Class for Disabled Children and many are placed on the list for consideration for admission to the Home for Handicapped Children when this is built in 1952. Our work for crippled children who will not gain admission to this home is seriously limited by lack of transport and at the moment it is difficult to see how this can be rectified except by the generosity of some local organisation.

The mentally defective children have been extremely unfortunate. There is no home under any authority in the Colony where these children can obtain residential care and the only measures taken have been those to relieve the general conditions in the household where the patient lives. The homes where these children live are more than handicapped by their presence. They usually require an adult to look after them all day and take up valuable space in confined cubicle rooms. Some of these children have been extremely difficult to handle and have required forcible restraining, while others have been completely paralysed and helpless, requiring continual home nursing care. On the register here there are only twelve names but it is known that not all the patients in this hospital are referred to the Almoner and a list is also being kept in the Social Welfare Department. Although the Social Welfare Department have on their programme a home for mentally defective children the Almoner thinks

that this will only cater for those who are able to do something for themselves including occupational therapy and some form of practical work. The Almoner would therefore like to make it known that many of the congenital mentally defective children will be left uncared for and the lower standard of living in their respective families will continue. Unfortunately the part of the Medical Plan which will cater for these children cannot be given a high priority in view of the many other more urgent commitments which face the Department.

All children attending hospital and suffering from undernourishment can collect free skimmed milk. The amount distributed increased from 48 lb. per month in January to 312 lb. per month in June.

Money for general relief to support the destitute families and dependants of the sick, money for special diets, and for emergency help is required in increasing amounts. The \$300 per month from the James Craig Fund has been distributed and during the first six months 198 families have benefited. This is only a small number of the sick who are really in need of help and under the terms of the Trust all the out-patients are excluded. The Almoners in Singapore will have to give added thought to means of raising money for patients suffering from incurable carcinoma, for the blind, for the hemiplegic patient, and for others who are incurable but are unable to get residential care. It is quite a common thing for the husbands to leave the wives and children destitute if the wife is bedridden: when the husband is sick the wife stays at home to care for him thus limiting the family income further.

The British Red Cross Society has granted \$125 to the General Hospital to help with patients' fares to and from the clinics for treatment, and \$75 to Tan Tock Seng Hospital. This is a great encouragement to patients who are undergoing long-term treatment to continue with their treatment and their attendances.

The activities of the British Red Cross Society deserves special mention as the work already started by it has been an inspiration to many of our patients both young and old. An Old People's Club has been organised and many of our aged patients attend. This club, although only organised for entertainment purposes, is extremely popular and is also used enthusiastically by the blind adults. A Club for Handicapped Children is also used by the Department and the children with disabilities are taken to swim and play games with other children with similar handicaps. Finally the Red Cross has in the Hospital a loan store where equipment can be loaned to patients who are either unable to afford their own or for some reason are unable to obtain the articles required.

In the last report it was mentioned that the first Student Almoner had been selected and had begun her training in October 1950. Her training has therefore been in progress throughout this year. Her first seven months were spent in the General Hospital and in August she was transferred to Tan Tock Seng Hospital for further experience under the Almoner working in the Tuberculosis Unit. The Department is extremely grateful to the external lecturers who have given her individual instruction in Psychology and Administrative Law and we appreciate also the help given by the University of Malaya in allowing her to attend the course on Social Medicine and Public Health in the Faculty of Medicine.

The Almoner in the General Hospital is convinced that it is necessary to give locally recruited students a basic training in their own country in preference to sending them abroad direct from the University. If students are sent too soon to gain knowledge in a country where the social services are more highly developed there is great difficulty in re-adjusting them within their own communities on their return. After experience in their own Colony however, they are able to apply what they have learned abroad to the difficulties which they meet in Singapore.

The four vacancies for students this year have so far not been filled due to the fact that no student suitable for the profession, in which personal qualities form the basis, has been available. Publicity to the profession must be given in the schools so that the girls can aim at the University Course. This should ensure a regular supply of students for the profession. An Almoners Training Committee is being set up to advise on the recruitment of Almoners, to select students for training, and to plan and approve the training course itself.

Further development in the General Hospital in 1952 will be possible when more qualified Almoners are appointed to work in the individual Units.

The Almoner's division started to function for the first time in Singapore in 1949 following an investigation by a visiting senior Almoner from St. Thomas' Hospital, London, in 1948. Thus this is a comparatively new departure for this part of the world although it has been fully realised in the United Kingdom how vital and essential this Service is in any hospital organisation. As a hospital of the size of our General Hospital employs a very large team of Almoners in that country it is clear that our minute organisation in this respect has covered a very important and onerous duty under the most exacting and difficult of conditions. At the turn of the year the Service had been built up to six Almoners (one locally appointed). As these cover the whole hospital organisation of Singapore they are still trying to do the work of ten times that number in London.

CHAPTER TWENTY

TUBERCULOSIS

(TAN TOCK SENG AND CHILDREN'S ORTHOPÆDIC HOSPITALS)

TUBERCULOSIS was again the most important communicable disease in Singapore and it continued to receive very considerable attention in the public Press. The work of the division has been expanded steadily from year to year over the post-war period and 1951 was no exception although no more beds could be added. These will be raised from the present 500 to 1,100 under the Medical Plan. Bed accommodation is now five times the pre-war in this connection: the present Government effort is many times that of any previous decade.

The most prominent landmarks of progress in the tuberculosis field during this year were the laying of the foundation stone of the new Singapore Anti-Tuberculosis Association Clinic by His Excellency the Governor, Sir Franklin Gimson, at Prince Edward Road, Singapore, on 26th October, 1951, and the gift of the former South Winds Mansion and the land surrounding it to Government by Mr. Lee Kong Chian as a site for a new Tuberculosis Sanatorium. This latter gift will provide a pleasant seaside site for some forms of this disease: it overlooks the western approaches to Singapore Harbour. The land is pleasantly wooded and possesses considerable possibilities. It is proposed to make a start with the housing of 100 beds here, with a later expansion to 300 here or elsewhere.

While this chapter is of necessity largely a report on the Government's control of tuberculosis, acknowledgment must be made to the increasing part being played by the Singapore Anti-Tuberculosis Association in its valuable contribution in the propaganda field on the one hand, and in diagnosis and out-patient treatment on the other. The Singapore Anti-Tuberculosis Association clinic is at present in two parts—one diagnostic where any individual or employer may get X-ray photographs taken of himself or his staff for a small fee. When an abnormal appearance is found, the patient is instructed to report to his own doctor, to the Singapore Anti-Tuberculosis Association treatment centre or to the Government tuberculosis clinic. This inexpensive X-ray service has been used by many progressive employers to get routine checks on all their staffs, and in most cases has been associated with considerable sick leave benefits. The other part consists of a treatment centre which is an out-patients' institution which now deals with as many out-patients as those attending the Government centre in the Rotary Clinic in Tan Tock Seng Hospital. At the Singapore Anti-Tuberculosis Association centre treatment is only paid for by those who can afford it. This procedure enables many free cases to be dealt with. A Government contribution to the Association is used to increase the scope of this work. The diagnostic centre also assists in routine X-rays of contacts of tuberculosis cases found by the School Health Department.

Tan Tock Seng Hospital continued its role as the main Government Tuberculosis centre. The Out-patients Department situated in the Rotary Tuberculosis Clinic given by the Rotary Club of Singapore in 1949 increased

its ability to cope with the steadily rising number of tuberculosis patients by instituting regular afternoon sessions in addition. In 1951 a further 2,509 new cases were referred to the Hospital for assessment and treatment. Of this total, 1,936 were proved to have active pulmonary tuberculosis and were given the appropriate treatment. This compares with the total of 2,378 new cases sent for assessment and treatment in 1950, many of whom of course, are still attending. The total number of out-patients in regular attendance is now over 3,500. Some 12,500 cases have passed through the centre since 1946. Of the out-patients who come to the hospital many of the more advanced continue for a short time only as their request is always for admission: quite a number cease to attend when they discover the long waiting list. Of those in regular attendance most are in receipt of some form of active therapy. Out-patient attendances reached 58,970 during the year and to these can be added 5,000 contacts.

In January 1951 the organisation of the Out-patients Department was thoroughly revised and the out-patients then attending were divided into groups, each allocated to one particular doctor who would have the services of the Specialist for consultation on each case as necessary. So patients have added continuity of treatment. Each is seen on first coming into the clinic and investigations are continued until either activity is proved or the case is discharged as arrested. When activity is proved an appropriate plan of treatment is outlined by the consultant and instituted by the rest of the staff who refer the case back from time to time for further advice.

Proper assessment has become an increasingly important aspect of the work. In the past few cases ever came to the hospital unless they had some symptoms or signs relating to chest disease. Now due to the general availability of checks and X-rays at Government institutions and at the Singapore Anti-Tuberculosis Association, and as Government and the City Council have now instituted routine X-ray pictures as part of the general physical examination of all recruits to the service, large numbers of cases are being picked up.

Radiologically it is often impossible to distinguish between the active and the arrested lesion. While it is very important to avoid unnecessary treatment of cases who do not require it, there is the very important danger of labelling a healthy man as tuberculous on insufficient evidence, and there is a serious risk of developing a new class of the population who may be accurately termed as "the X-ray unemployable". Quite apart from the fact that the present volume of work and the duration of treatment are such that the resources of our existing services are severely over-taxed, the routine procedure on the investigation of radiological pick-up cases in the absence of symptoms is to regard them as inactive unless evidence either of radiological progression, of bacteriological, of clinical or of symptomatic advance is forthcoming. Once the activity of such a case is established it is then transferred to the general register for treatment. This scheme will be further advanced by the creation of two units in the near future.

Of course tuberculosis continued again to attract special attention in Singapore and pressure was exerted to expand the work of this division of the medical services far beyond the scope envisaged in the Medical Plan and far beyond anything possible in staff, accommodation and finance in the foreseeable future. Taking all existing circumstances into consideration, the work of this division has been expanded to a remarkable extent over the post-war period. Present out-patient and in-patient treatment is beyond any comparison with any previous period. Chest X-ray examinations at Tan

Tock Seng Hospital alone came to 24,408 out of a total of 52,199 examinations for the whole service. This compares with a total of all X-rays of only some 21,000 in 1948 and 6,000 in 1938.

The main effort by Government has been directed to treating those cases in which the disease can be arrested. Not much has been attempted for the hundreds of very advanced cases for whom nothing satisfactory can be done. Admission of these patients into hospital accommodation, and the institution of modern treatment and good diet, inevitably means a rapid increase in the proportion of chronic wards and equivalent increase in expenditure on family relief.

At present some half million dollars is being spent each year on treatment allowances for treatable cases, and this is only the beginning. In the near future Government's annual commitment on tuberculosis control in all its aspects will reach the three million dollar mark, and this is quite apart from the capital expenditure on expansion of the service in the foreseeable future.

While action is proceeding to collect as much standardised information on incidence as possible through X-ray statistics, and plans are in hand for a two-year survey in addition to the material which will be forthcoming from the B.C.G. campaign which started this year under the auspices of U.N.I. C.E.F., and W.H.O., the fact remains that crude death rates have still to be relied on for an estimation of the existing position in regard to incidence.

Crude deaths and death rates from pulmonary tuberculosis show a considerable decline since the liberation in 1945, and a striking improvement over pre-war figures. Taking the 1939-41 death average as 100 (2,288 per million), the 1947 index was 70 (1,550), 1948, 65 (1,490), 1949, 57 (1,315), 1950, 52 (1,193) and 1951, 46 (1,052). These figures have been subject to criticism as many deaths are still not certified by a qualified medical practitioner. The criticism applies to all years, however, and less to more recent times. It is more than probable that deaths from other causes entered as pulmonary tuberculosis outnumbered mistakes the other way round. In consequence this decline can be taken as actual.

SURVEY OF GOVERNMENT DEPARTMENTS

The survey of Government servants started at the end of 1949 and carried on in 1950, was completed in 1951. The figures of the three years have been combined to give the picture as outlined below.

While this sample cannot be regarded as a truly satisfactory one in that it depends on volunteers from Government recruits, since 1949 all admissions to the Government Service have been X-rayed before entry. Before that date routine X-rays did not form part of the physical examinations. So most of the cases surveyed had not been X-rayed before although some cases of known tuberculosis turned up in the survey. The total number of persons dealt with in the whole 1949-51 period was 4,180. This produced 41 cases of active post-primary pulmonary tuberculosis and one case of active primary tuberculosis. These combined give a figure of 1 per cent active tuberculosis in the group. In addition 80 cases of arrested post-primary pulmonary tuberculosis were observed giving a percentage of 1.9. Unfortunately no accurate figure for calcified primary tuberculosis is available. In the whole group the percentage of tuberculous shadows seen on routine X-ray was just 3 per cent. So one per cent was proved to have active pulmonary tuberculosis.

DEFINITION OF STANDARDS USED IN THE SURVEY AND IN ASSESSMENT
OF CONTACTS

It is necessary to define what method is followed in assessing standards of activity and for the apparently arrested.

(i) *Primary tuberculosis*. Active primary radiological shadows both parenchymal and hilar which persist over a period of three months are taken, both constituents of the complex being visualised and seen to persist. Sputum examinations are seldom attempted in small children although it is well recognised that gastric lavage if repeated will give a high percentage of positive cultures in active primary cases. Our limited laboratory facilities in any case do not justify this procedure. The criteria for apparent arrest for a case of primary complex is calcification of either one or both components without radiological change over a period of observation of six months or more.

(ii) *Post-primary tuberculosis*. Post-primary lesions have again been divided into only two categories, the following being classed as active:—

- (a) clinical—a raised temperature and/or persistent rales over the affected lesion plus a raised sedimentation rate. (A raised sedimentation rate in the absence of other signs of activity is disregarded.);
- (b) radiological—radiological progression or regression during a period of observation of three to six months in the absence of other signs of activity is accepted as evidence of activity;
- (c) evidence of pleurisy with effusion;
- (d) a positive sputum—either on direct examination, anti-formin concentration or culture.

(iii) *Apparently arrested post-primary*. This term was chosen with some hesitation as the word quiescence might more properly be applied to many of the cases under this heading. Possibly the period of observation has been too short to speak in definite terms of 'arrest'. The criteria for an apparently arrested case are:—

- (a) absence of symptoms;
- (b) absence of radiological change over a period of six months or more;
- (c) negative sputum—a combination of (a), (b) and (c) constituted an apparently arrested case.

Incidence of Tuberculosis in Hospital Staff

There have been recurrent calls from the junior members of the staff and in particular from the Hospital Servants Union for 'danger money' because of what is claimed as an increased risk due to work in a tuberculosis hospital. The figures for the survey of Government officers on the one hand and the figures for the routine check of the entire staff of Tan Tock Seng Hospital have an interesting bearing on this contention.

MASS SURVEY 1949-1951—GOVERNMENT DEPARTMENT'S

Department	Total X-rayed	Total Abnormal X-rays	PRIMARY T.B.		POST-PRIMARY T.B.		SPUTUM OF ACTIVE-CASES		Other T.B. Condi- tions	Other Pathological Conditions	N.A.D.	Left Govt. vice
			Active	Apparently Arrested	Active	Apparently Arrested	Pos. (+)	Neg. (-)				
Treasury ..	80	8	..	1 (1.2%)	..	5 (6.2%)	..	..	..	1 Kyphoscoliosis Emphysema	1	..
Master Attendant ..	233	17	1 (.4%)	2 (0.8%)	4 (1.7%)	8 (3.8%)	3	2	1 Cervical gland enlarged	2 (1 Pneumonitis) (1 Bronchiectasis) in T.B. Patient	..	..
Tan Tock Seng Hospital ..	541	3	..	..	3 (0.55%)	..	..	3	..	..	..	..
General Hospital ..	268	16	..	..	3 (1.11%)	11 (4.1%)	1	2	..	1 Pneumonitis	1	..
Kandang Kerbau Hospital ..	78	3	..	..	1 (1.28%)	1 (1.28%)	..	1	..	..	1	..
Middle Road Hospital ..	11	1	..	..	1 (9.09%)	..	..	1	..	..	..	..
Woodbrigde Hospital ..	199	..	..	..	..	..	..	..	..	..	..	..
Trafalgar Home ..	5	..	..	..	..	..	..	..	..	..	..	..
Customs ..	8	1	..	..	..	1 (12.5%)	..	..	..	..	..	..
Secretary for Economic Affairs	14	1	..	..	..	1 (0.7%)	..	..	..	..	..	..
Government House ..	45	4	..	..	2 (0.4%)	1 (0.2%)	1	1	..	..	1	..
Telecommunication ..	464	25	..	2 (0.4%)	7 (1.5%)	13 (2.7%)	2	5	..	2 (1 Pneumonitis) (1 Penumonitis) in T.B. patients	1	1
Government Printing ..	237	14	..	..	4 (1.68%)	..	1	3	..	2 (1 Pneumonitis) (1 Bronchiectasis)	2	..
Police ..	1,997	82	..	1 (0.05%)	16 (0.8%)	33 (1.65%)	7	9	..	8 (4 Heart Condi- tions) (2 Eosinophilic Lung) (1 Pneumonitis) (1 Enlarged Liver)	21	2
	4,180	175 (4.18%)	1 (0.02%)	6 (0.14%)	41 (0.98%)	80 (1.91%)	15	27	1	14+2 in T.B. Pateints	28	3

Since 1949 all members of the Tan Tock Seng Hospital staff including new recruits taken on in the hospital have had X-rays taken at six monthly intervals. All have been mantoux-tested as well and only positive reactors are allowed to work in contact with tuberculosis patients. Negative reactors are vaccinated with B.C.G. and only allowed to enter the wards after conversion. Since that time only 6 members (3 in 1950 and 3 in 1951) of the hospital's staff have developed pulmonary tuberculosis out of 846 examined. This represents a percentage considerably below the average found in the Government Service. The difference although probably not statistically significant disposes of any claim to 'danger money', and suggests that the measures taken to protect the staff are effective. In 1951 two of the three cases which developed tuberculosis were hospital drivers, individuals not by any means as close contacts as those working in the wards.

The survey noted above would appear to indicate a 1 per cent incidence. If a 30 per cent error margin is added for safety it might be assumed that something like 1.3 per cent unrecognised tuberculosis exists amongst the apparently healthy adult population. Sputum positives were found in only 15 of over 4,100 cases giving a percentage of some 0.36. This suggests that only some 0.5 per cent of the apparently healthy is disseminating tubercle bacilli in its sputum. Even this assessment with the many obvious cases known to exist adds up to some thousands of dangerous cases however—a very considerable public health problem. This is an aspect of tuberculosis control which is receiving the active attention of a special Committee of Chinese gentlemen set up by the Secretary for Chinese Affairs. It is hoped by this means to offer some form of 'home' for such sufferers. Clearly the amount of money which can be spent by the Government on this disease in view of its many other medical commitments must be limited at present to the reasonably curable. Many of the others cannot be touched at present.

If the crude death rate is given a 50 per cent error margin and a calculation of five cases per death is allowed taking into consideration the suspected high incidence of the Chinese to this disease a figure of some 8,000 is reached. If the 1.3 per cent noted above in the unsuspected is added this gives a total of some 21,000 possible cases of tuberculosis. That is some 2 per cent of the population is affected. This is considered to be a generous estimate.

In the Leprosy Settlement and its convalescents totalling 1,000 an incidence of 1.5 per cent active tuberculosis has been found. This again suggests an incidence in the population at large well within the above figure, and this is supported again by the figures for school children.

SCHOOLS HEALTH DEPARTMENT TUBERCULOSIS STATISTICS

While these are stated in detail in Chapter Fifteen of this Report the following is a summary from the school figures:—

Number with T.B. present radiologically	...	...	315
Primary complex—active	...	...	125
Primary complex—healed	...	...	118
Re-infection type—active	...	...	66
Re-infection type—inactive	...	...	6
Post-primary	...	...	—
Total school children X-rayed	...	...	5,434

Thus 1.2 per cent of these school children showed signs of an active pulmonary lesion as compared with 0.84 per cent in 1950 (5,819 examined) and 1.6 per cent in 1949 (3,174 examined). 0.4 per cent had a positive sputum compared with 0.17 per cent in 1950 and 0.3 per cent in 1949.

Non-pulmonary tuberculosis appears to have shown a slight increase over recent years although the number of cases is small. This form of the disease is more usually associated with the use of fresh whole milk and this is not a common practice here. The introduction of more cows and the use of more fresh milk must be kept in mind in this connection however. The greatest care must be taken that all herds are free from tuberculosis in view of the fact that infection from this source is not thought to be a problem so far.

Notification of the disease appears to have been a failure up to date. Whether it can be established on a sufficiently satisfactory basis in such a community as this at the present time as to be of any value is a question which has to be carefully considered. Dr. Morland, a visiting Tuberculosis Specialist from the United Kingdom, was of the opinion that compulsory notification could not be effective without far-reaching economic security measures.

ADMISSIONS

In-patient admissions for tuberculosis in the Government Hospitals in Singapore for 1951 are set out in the table below. These do not take into account the short duration of stay of those cases admitted to the General Hospital as medical emergencies, and later found to have tuberculosis, nor many of the 437 Tan Tock Seng Hospital cases admitted for phrenic crush operations which are in most cases done on patients specially admitted for a few days for that purpose.

TAN TOCK SENG HOSPITAL

Tuberculosis

In-patients

Pulmonary	...	...	...	...	1,397
Disseminated	...	...	...	...	11
Bones and Joints	...	...	...	...	18
Other forms	...	...	...	...	4

CIVIL GENERAL HOSPITAL

Pulmonary	...	...	...	...	642
Disseminated	...	...	...	...	52
Bones and Joints	...	...	...	...	105
Other forms	...	...	...	...	333

ORTHOPÆDIC HOSPITAL

Bones and Joints	...	...	...	...	66
Other forms	43

Total number of In-patients admitted to the above Institutions	2,671
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Some 1,000 tuberculosis cases seen in the out-patients could not be admitted for necessary in-patient treatment. All cases coming to the Rotary out-patient clinic are registered and treatment started as out-patients. Admission is made from the waiting list of these patients according to their various priorities on medical and social grounds.

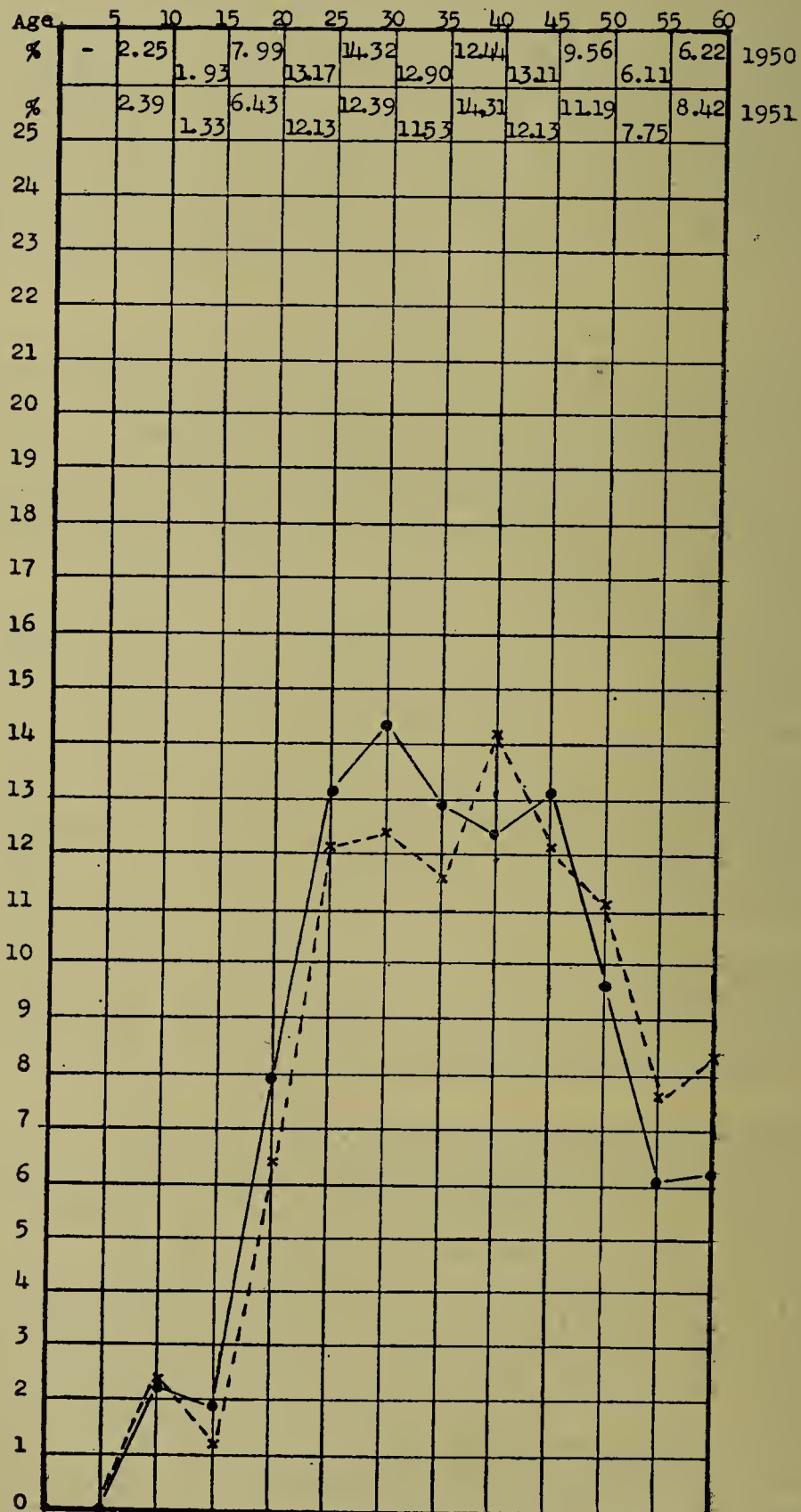
When the 3,500 odd total cases attending the out-patients are added to the 60,000 odd total attendances, it will be seen that the work dealt with at the Tan Tock Seng Out-patient Department in 1951 was a record and some four times that of the 1948 period. The Rotary Out-patient Clinic, opened by H.E. The Governor in April, 1949, as a gift from the Rotary Club of Singapore, is to a great extent responsible for this, but the steady increase in the numbers coming forward will soon tax even this excellent and modern accommodation to the utmost. Certainly the increased staff available has been stretched to the limit to deal with the present numbers. Out-patient demands must be expected to increase, however, until more beds are available.

TAN TOCK SENG HOSPITAL

Percentage of T.B. cases seen according to Age Distribution for 1950 and 1951.

1950—Total cases: Males = 1,914 (Black Line)

1951—Total cases: Males = 1,509 (Broken Line)

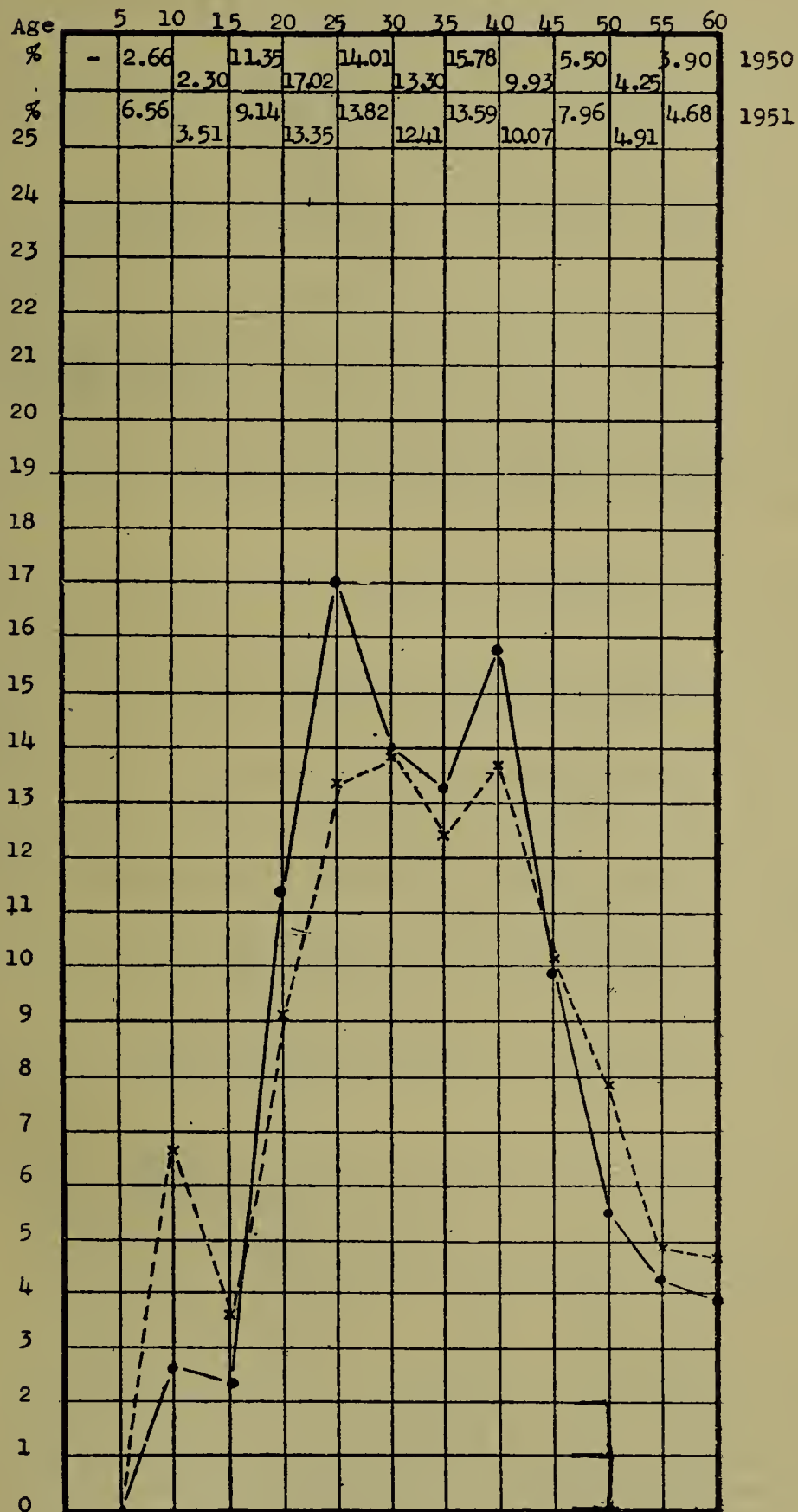


TAN TOCK SENG HOSPITAL

Percentage of T.B. cases seen according to Age Distribution for 1950 and 1951.

1950—Total cases: Females = 564 (Black Line)

1951—Total cases: Females = 427 (Broken Line)



TAN TOCK SENG HOSPITAL
RETURN OF WORK DONE—ROTARY TUBERCULOSIS CLINIC, 1951

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1. Number of New T.B. Cases	144	104	118	131	141	141	129	162	166	205	201	167	1,809
2. Number of Repetitions	3,827	3,292	3,627	3,583	4,081	3,996	4,459	4,817	4,750	5,841	5,973	7,193	55,439
3. New Assessment cases	15	50	44	22	65	40	27	54	47	66	90	53	573
4. X-Ray examinations	2,059	1,988	1,925	1,857	1,886	1,840	2,257	2,342	1,929	2,185	2,155	1,955	24,378
5. Fluoroscopic screenings	308	241	322	303	386	296	324	369	351	398	384	366	4,048
6. Laboratory Examinations	4,139	4,256	4,124	5,033	5,612	5,327	5,353	5,537	5,508	4,875	4,885	5,123	59,772
7. Dispensary Routine issues	2,914	2,366	2,519	2,584	2,991	2,890	3,131	3,262	3,254	3,987	4,173	4,035	38,106
8. P.A.S. . . .	32	39	63	89	293	371	516	636	608	665	654	640	4,606
9. Thiacetazone . . .	..	4	64	120	224	238	271	280	254	294	310	326	2,385
10. Streptomycin Injections	..	..	..	..	458	1,071	1,282	1,554	1,581	1,648	1,616	1,740	10,955
11. A. P. Inductions	1	..	..	..	2	..	..	..	..	3	1	1	8
12. A. P. Refills	165	133	190	178	194	164	150	178	165	171	156	151	1,995
13. P. P. Inductions	39	14	36	59	60	49	53	41	64	57	78	50	600
14. P. P. Refills	1,750	1,401	1,518	1,587	1,800	1,361	2,092	2,573	2,111	2,741	2,916	2,781	24,631
15. Aspirations	28	19	28	23	51	32	35	31	40	45	41	38	411
16. T. B. Specialist Consultations	732	804	908	1,180	1,310	1,159	1,284	883	1,231	1,462	1,294	1,428	13,675
17. Home visits for T.B.	546	462	441	356	261	381	439	382	423	452	441	459	5,043
18. 1st Home visits to Contacts	58	48	62	87	47	47	65	85	65	106	89	71	830
19. 2nd Home visits to Contacts	266	248	315	338	170	241	601	578	413	386	397	249	4,202
20. Tuberculin Jelly Test	145	118	133	183	89	120	172	103	119	104	83	65	1,434
21. Jelly Reading done	140	110	146	168	98	126	165	108	121	104	83	65	1,434
22. Contacts at Clinic 1st attendance	134	118	86	70	69	64	59	93	86	60	55	61	955
23. Contacts at Clinic 2nd attendance	136	199	242	95	157	82	137	214	202	204	269	198	2,135
24. School Children, New	5	4	21	7	3	17	9	9	14	5	7	6	107
25. School Children Repetitions	56	64	87	83	70	59	66	43	63	72	45	43	751
26. School Children T.B. Contacts	..	..	..	..	..	15	17	14	21	26	22	22	137
27. School Children T.B. Revisits	..	..	..	..	..	16	4	21	21	18	24	29	133
28. Teachers, New	..	1	4	..	5	..	4	..	3	..	3	..	20
29. Teachers, Repetitions	24	22	20	39	33	38	30	14	20	16	16	9	281
Total	17,668	16,105	17,043	18,175	20,556	20,181	23,131	24,383	23,630	26,196	26,461	27,324	260,853

It is somewhat difficult to judge accurately the work of our Out-patients Department in comparison with clinics elsewhere, as different clinics employ different methods in enumerating the services given to patients and so assessing the work done. The table given here shows a total of 260,853 individual services and it can be seen that the work in the Government Clinic steadily increased throughout the year in almost all divisions. Drugs have been enumerated as individuals on a particular drug during each month, with the exception of streptomycin injections, which in every case represent the number of injections given during that month: the average number received by any patient in a month was eight. If drugs like P.A.S. and thiacetazone are represented in the form of patient-days of a drug, the total figure of service is swollen to 324,348. It would appear to be justifiable to use this figure to illustrate to the public the actual service supplied to the people as evidence of expenditure.

Tuberculosis is without doubt in a higher proportion of Singapore's population than in that of the United Kingdom where some 700 beds are available per million as compared with some 500 in Singapore. Well over 3,000 beds would be required to deal with our problem completely and ideally, but even the 1,100 envisaged under the Medical Plan will take us quite a long way along the proper path, particularly with the added and considerable out-patient facilities contemplated in various directions. (General, School Medical, Singapore Anti-Tuberculosis Association, Rural Clinics and so on).

Professor D. E. C. Mekie performed thoracoplasty operations on 30 patients referred from the Tan Tock Seng Hospital, and 23 cases referred for internal pneumolysis were dealt with in his wards in the General Hospital. The number of thoracoplasties done is almost twice that of 1950. Experience with artificial pneumothorax in this hospital has shown that a large proportion have adhesions, either indivisible or so close to the great vessels that division would prove dangerous and this procedure has decreased in popularity. Further the shortage of beds makes the proper use of pneumothorax difficult as the out-patient induction of this type of treatment is accompanied by an unwarranted hazard. The type of disease seen here is usually more suitable for treatment by phrenic paralysis combined with pneumoperitoneum, and later covered with a thoracoplasty if necessary. The use of antibiotics with collapse therapy has been used to a considerable extent on the regimen described in the section dealing with streptomycin, and has been of great benefit. The need for a special chest surgery unit is increasingly felt. This advance received added attention during the year and it is hoped to give it active consideration in the not too distant future as the Medical Plan advances.

The chart for age distribution of males and females this year is falsified by the fact that the figures of 1,509 (male) and 427 (female) represent cases of proved tuberculous activity as against the 1,914 (males) and 564 (females) in 1950, which included some 500 cases for assessment in which activity was not proved. There is a slight shift to the right on the distribution graph but the importance of this is probably offset by the slight alteration in the sample examined.

ADMISSION OF CHRONIC CASES OF PULMONARY TUBERCULOSIS

The main effort by Government has been directed to treating those cases in which the disease can be arrested. It has been impossible to increase the scope of the service to help the many very advanced cases in which arrest is impossible. Hospital accommodation cannot be spared for these as their period of institutional care would necessarily result in blocking beds for

treatable cases. However, 100 beds in Tan Tock Seng Hospital have been reserved for advanced cases (75 beds on the male side and 25 on the female side), particularly for those with tuberculous laryngitis and other painful forms of the disease, and for those who have been abandoned by relatives and friends.

During the year an approach was made through the Secretary for Chinese Affairs to the Chinese Advisory Board to start an institution for destitute tuberculous patients. The Advisory Board appointed a committee to consider this proposal, and the committee recommended a scheme starting with 100 beds but with potential expansion.

It must be repeated that 1,000 of the tuberculosis cases seen in the out-patients could not be admitted due to shortage of accommodation. Admission is made from the out-patients on the register according to various medical and social priorities. A number of cases are admitted from the Singapore Anti-Tuberculosis Association direct, on the urgent representation of its almoner or medical officer when a bed is available.

Hæmoptysis cases are admitted to the wards for a short period until the bleeding stops and are then discharged to take their turn for admission. A few beds are reserved for such emergency admissions.

FOLLOW-UP ON THE EXPERIMENT WITH REGARD TO ADMISSION OF CHRONIC T.B. PERSONS

In 1950 an experiment was initiated in this connection by opening a ward for chronic cases suffering from fibrocaseous disease incapable of sustaining competition in the open market for work but not ill enough to demand complete care and attention in a hospital. All these cases had cavities and were excreting tubercle bacilli in their sputum. These patients were expected to assist in the running of the ward by keeping it clean, making beds and distributing food and medicine. Whenever one developed a small hæmoptysis he was instructed to regard it as of minor importance and after a few days was allowed to proceed as before. In 1950 17 cases out of 36 had minor incidents of this type: in 1951 the same trend continued. Only a few of the cases improved sufficiently to warrant interference either with antibiotic or collapse therapy: these were put on a stricter sanatorium regimen. This not surprisingly had a disastrous effect on the work willingness of the others. So a ward which was started as a place where unstable chronics could receive treatment, unfortunately has become an additional treatment ward for very long term treatable cases. It was finally decided that it was impossible to carry out in one hospital two standards of treatment, one for those cases initially assessed as having a good prognosis, and one for those initially assessed as being poor risks. The more advanced soon had to be transferred to the wards for more advanced cases requiring full nursing care. The experiment was a failure as one for housing chronic tuberculosis patients.

GOVERNMENT TUBERCULOSIS ADVISORY BOARD

The Government Tuberculosis Advisory Board was set up in 1949 to co-ordinate the various aspects of tuberculosis control in Singapore. It considered three particular problems during the course of 1951. The first of these was a consideration of the employment of persons found to have X-ray shadows of tuberculous origin, with advice to employers on persons who had recovered sufficiently from active tuberculosis to enable them to earn a living without risk to others.

It has been noted already that the Government and the City Council have now included routine X-ray examinations in the normal examination of candidates for the public service. Further, it has been observed that the survey of Government Officers has indicated that some 4 per cent had X-ray shadows which were of tuberculous origin but only one in 4 of these were found to be suffering from active pulmonary tuberculosis. This means that large numbers of people are being found with stigmata of tuberculosis who are not suffering from any active form of the disease who might well be excluded from employment by a routine X-ray examination of the chest if some system is not adopted to assist these candidates and at the same time to safeguard the employers' interest.

The Advisory Board accordingly appointed a sub-committee consisting of representatives of the Government, the Singapore Anti-Tuberculosis Association and the City Council to make recommendations in this connection. The Government and City Council were still considering these recommendations at the close of the year.

In general, the recommendations were to the effect that Government should employ persons with radiological stigmata in the absence of any evidence of present activity, and that following a period of observation these should be subject to the same terms of service as persons with clear X-rays save only that evidence of reactivation which results in termination of services on medical grounds should carry a penalty in regard to pension and gratuity rights. It was felt by the Board that the Government and City Council should give a lead to private employers by generous treatment of ex-tubercular patients as otherwise many persons who were in sufficiently good health would fail to obtain employment, thereby subjecting the radiological control of employees to such suspicion that its use would eventually have to be discarded.

The second item of importance discussed by the Board arose from a memorandum submitted by the Chairman of the Singapore Anti-Tuberculosis Association's Medical Advisory Board on the subject of a home for the tuberculous destitute. A medical sub-committee of the Government Advisory Board was formed to help solve the problem of the patient who finds himself destitute due to his failure in earning capacity: perhaps evicted from his home on account of his disease. The Government Service is already stretched to capacity and so is unable to offer any further solution than the four hundred beds at present available for this disease in the Tan Tock Seng Hospital. The Singapore Anti-Tuberculosis Association too is also stretched to the limit of its present resources. Independently of the memorandum from the Singapore Anti-Tuberculosis Association, but arising indirectly from it, is the move through the Secretary for Chinese Affairs noted elsewhere in this Report.

The Chinese population in Singapore is divided by dialects into different communities. Three of these have organised their own folk hospitals or houses of rest where their more unfortunate members can obtain shelter, with in some cases food and medical attention. The Cantonese community for instance runs a 400 bedded institution known as the Kwong Wai Sui free hospital where a considerable number of beds are devoted to tuberculosis. These are available for the members of the community only but Cantonese patients can often find refuge in the institution if their homes are unsuitable. The Hylam community has a smaller institution of some 30 beds which is largely filled with tuberculosis cases which are out-patients of the Tan Tock Seng Hospital, and the Almoner of the latter hospital has organised a feeding scheme for their proper sustenance. The Kheks from Taipu have also a small but useful hospital of their own. The Hokien and Teochew however, who

form the bulk of the Chinese population in the City, have no such facilities. Neither has the Indian community, or the Malays, and these people present a particular problem. It is to help to meet this general problem that the Secretary for Chinese Affairs has asked the Chinese Advisory Board to consider the question of accommodation of destitute tuberculosis patients.

The third problem which came up for consideration was the question of housing priority for families containing members suffering from tuberculosis. The Singapore Improvement Trust had for some months been granting priority in allocation of quarters to persons who could be certified as suffering from this disease. There was however no differentiation between the case of arrested tuberculosis, primary tuberculosis, active cavitating tuberculosis, tuberculous meningitis or bone and joint disease. Any case provided it was duly certified received the same priority. The Improvement Trust sought the advice and assistance of the Board as to granting priorities to the different types of the disease. To ensure that co-ordination of opinion would be obtained another medical sub-committee was formed to make recommendations to the Board on this matter.

STREPTOMYCIN AND SODIUM PARA-AMINOSALICYLATE (P.A.S.)

During 1951 the out-patient treatment of suitable cases of tuberculosis with streptomycin and P.A.S. was started. The scheme which was followed was based on the regimen described at the U.S.A. 9th Streptomycin Conference by the Veterans' Administration of America where this drug was given by bi-weekly injection of 1 or 2 grammes combined with 12 grammes of P.A.S. orally daily. The report described the absence of the production of streptomycin resistance, and compared very favourably in the clinical results with the daily administration of streptomycin alone in dosage of 1 or 2 grammes daily. The warning issued by the Medical Research Council workers that resistance occurred in a high proportion of cases treated with streptomycin alone in the absence of P.A.S. was also heeded, and with the co-operation of the Department of Bacteriology of the University of Malaya, a trial of various regimens with the administration of streptomycin both in in-patient and out-patient cases was started.

While it is too early to give any final figures certain facts have already emerged:—

- (a) that streptomycin resistance does occur in a considerable proportion of cases treated with that drug alone, the sputum remaining positive at the end of the course of treatment. The cases in this series were all cases which had received their streptomycin outside the hospital or before the days of combined therapy;
- (b) that streptomycin resistance does appear to occur in a smaller number in which the interrupted technique is used combined with P.A.S. (10 per cent of all cases on combined therapy);
- (c) that P.A.S. resistance occurs in a number of cases with combined therapy. The duration of the resistance has not been determined as yet;
- (d) that valuable results would appear to be obtained in individual cases with the out-patient administration of streptomycin and P.A.S., when withholding the drug until a vacancy for admission arises would have resulted in hopeless deterioration of the case. A number of cases were satisfactorily treated as out-patients in this way. They no longer required admission when their turn came.

Two articles, one on Streptomycin by Professor J. W. Crofton of the Chair of Tuberculosis, University of Edinburgh, from the February 1952 number of the *N.A.P.T.* (National Association for the Prevention of Tuberculosis, England) *Bulletin*, and the other on *A New Cure?*, from the April 1952 issue, are of particular interest, particularly as opinions have been expressed in our local newspapers in the latter connection.

While the good results obtained by streptomycin are noted in the former the high proportion of those treated with the drug becoming resistant to its action are stressed. Later work has largely overcome this most dangerous disadvantage by the addition of P.A.S. (para-aminosalicylate) and the reduction of the daily dose of streptomycin.

The latter article refers to the new drugs which are hydrazine derivatives of nicotinic acid. Among them, the most promising is isonicotinic acid hydrazine, which has been prepared by two firms independently, namely, by the firm of Hoffman-La Roche under the trade name of 'Rimifon' and by the firm of E. R. Squibb and Sons under the trade name of 'Nydravid'. The chemical formula of the two is identical, and this is the drug which has so far proved the most effective in the present series of trials on tuberculous patients. It points out that many important aspects of this therapy require further study. In fact more recent reviews tend to suggest caution in assessing the results originally claimed.

Streptomycin as a drug would still appear to be the most effective in use.

ALMONER'S DIVISION

Miss S. Graham reports as follows:—

The year 1951 has been one of considerable progress and expansion in all directions. The work of the division has been much more varied and wider in scope and various schemes have been promoted and successfully carried through and are now running smoothly. However in spite of the general good progress I think it is important to note that the division has had to meet a very heavy burden of work during the year. There has been a continual increase in the number of new patients and the amount of treatment undertaken. Each session is now fully occupied with out-patient attendances, leaving little time to deal with the clerical side of the work. Re-organisation of the division has made it possible to keep a watching brief on all the patients passing through but I consider the personal relationship with the individual patient and the quality of service has suffered through this over saturation of work and will continue until there is a larger staff of trained almoners, although this selection will continue to exist.

To meet the problems of re-organisation the appointment of an investigator was approved in April 1951. His employment was an experiment in the use of an administrative assistant which I feel has proved an unqualified success. The appointment of similar people, carefully chosen, to work directly under a trained almoner could do much to relieve the present difficulties.

The first and most pressing problem in 1951 was to obtain a Welfare Fund to meet the many emergencies constantly arising. In the previous year a sum of \$282 had been collected from a few donations, but after the most careful husbanding only a little over \$100 remained, and with this small sum no far-reaching scheme could be promoted. Accordingly the Singapore Motor Club was approached and it very generously offered the proceeds of the sale of programmes at its speed trials. Members of the department collected vigorously and the sum of \$431 was obtained; and this formed the basis of the fund. Since then a total of \$6,118 has passed into the Fund during the year. An approach to Government for a small monthly sum to increase the scope of the work is still being followed up. During the year \$2,676 was spent on the welfare of the patients. \$1,500 is being held in trust for future developments for the Indian community leaving \$1,942 in hand for the new year.

Once the Welfare Fund had been established the problem of the out-patient attendances could be tackled. Many patients travel very considerable distances, and often they are too sick to use the normal means of transport. Then again their special treatment might entail frequent attendances. This problem was

emphasised with the start of the out-patient Streptomycin Clinic when patients were asked to attend twice weekly. In most cases these patients were from families which, owing to the very chronicity of the disease, were in the greatest financial distress. It was therefore imperative to assist with fares and this was begun in June. Very soon it became obvious that the Almoner's Fund could not meet this continual drain and a grant of \$75 per month was obtained from the Red Cross. Since this was not sufficient an approach was made to the Social Welfare Department to meet the bus fares of all cases drawing relief. This was agreed. It was agreed that Social Welfare should only pay bus fares, and attempts were made to try and organise the hospital ambulance to bring patients from the bus stop up the hill to the clinic. This arrangement is still working although not very satisfactorily as the ambulance is constantly being called for other duties. The Red Cross Fund was kept largely for emergencies where a taxi or trishaw was essential, and for assisting those on relief but who were unable to meet the regular expense of fares. Contacts also benefited under the Red Cross assistance, and the Almoner's Fund met any deficit over and above the grants received.

During the course of the year there were many and increasing demands for surgical appliances and for insulin syringes for home use. The local supplies were limited and of poor quality so arrangements were made to obtain a stock from the United Kingdom for which the Almoner's Fund met the initial expense. Later a deposit grant of \$200 was granted by the Tan Tock Seng Hospital Committee for similar supplies.

One of the constant problems is that of accommodation of the sick. Often patients are homeless and destitute and with the hospital beds always full the Almoner is faced with the serious problem of their future care. The only answer at present lies in the further development of facilities provided by the various communities, and I have continuously worked for this during the year. The Hylams and the Kheks have for some years run a sick hospital providing a free bed and shelter but they give little other service. With the assistance of Mr. Han, the contractor for the Singapore Harbour Board, I have arranged for hot meals to be taken to all the patients twice a day. Those with sufficient incomes have paid for their own; those on general relief have been subsidised by the Almoner's Fund. An approach has been made to the Hylam and Khek communities to assist and the Hylam community has agreed to do this for three months.

The Cantonese run their own hospital with food and medical services supplied, but so far there has been little response from either the Hokkien or Teochew communities. Many attempts have been made to obtain a similar support from the Indian community, but it is as yet too early to judge success in this direction.

In the same attempt to try and increase help for the care of the tuberculosis patient I have worked very closely with Mr. Rhind, the Personnel Officer of the Singapore Harbour Board, in the establishment of the Sick Bay there and a considerable number of ex-employees who are attending Tan Tock Seng Hospital for treatment has been dealt with by these means thus receiving facilities for rest and good food.

Many of the more advanced cases who obtain admission to Tan Tock Seng Hospital often remain for several years. Deserted by friends and without relations they have no means of obtaining such minor comforts as a new tooth brush, a comb or an occasional smoke. I have arranged therefore for a pocket money allowance of \$5 per month to be paid to them by the Social Welfare Department if they are destitute and have been in hospital for six months or more.

For those patients who are making a good recovery one of the major problems is to find suitable employment. In September a 'Rehabilitation Committee' was established under the Labour Department to try and place physically disabled persons where they would receive a training suitable to their limitations. Five tuberculosis patients were referred each month but unfortunately the response from employers has been so poor owing to the general fear of tuberculosis that the number has now to be drastically reduced to five every two months. Since the number is now so reduced it does little to meet this ever pressing problem, and I continue to try and use all my contacts in the business and other communities to try and place my patients. However the committee serves as an educational experiment which will perhaps bear fruit later on.

In November I was asked to speak to the Rotary Club on my work at Tan Tock Seng Hospital. Following this, leading members of the Indian community donated \$1,500 towards the welfare of Indian tuberculosis patients.

This I felt was inadequate to meet the need as it was for the provision of an Indian Resting place for the sick that I had been appealing. So it was arranged with the donors that the money should be held in trust while they tried to stir up further interest amongst their community to establish and maintain such a place. It is to be hoped that this plan will mature during 1952.

Over the year much has been achieved. The Almoner's Fund has received many donations and grants, but at the same time, the demands on it have been heavy and are likely to be more so during the coming year. Unfortunately it still remains without an assured income.

Additional clerical assistance has been obtained. It is expected that the student almoner will remain at Tan Tock Seng Hospital on her appointment in January, but this will still not provide adequate staff for all the needs of the division. The supervision of chronic contacts has not been adequately tackled so far and this needs further study.

RECOMMENDATIONS

An additional Almoner to work full time with our tuberculosis patients.

An assured income for the Welfare Fund. I have for a long time hoped to be able to start some form of supplementary feeding for the active primary contacts who come from very poor families. Many of these are not eligible for the Government feeding scheme and often suffer from a deficient diet. It is not possible to do this with the present funds. It takes a very considerable part of one's time to raise funds, and the Almoner's many other duties make this additional call on her services an onerous one.

The provision of some permanent form of transport for the patients up and down the hill to the clinic.

HEALTH VISITORS REPORT

A Contact Clinic is operated in and from the Rotary Clinic, Tan Tock Seng Hospital. The Health Sister works in close liaison with the Lady Almoner's Department, and it is from that Department that the Clinic is advised of the names and particulars of all curable 'T.B. Allowance' cases.

On the initial visit to a patient's home, advice is given on diet, sleeping accommodation, isolation of utensils, disinfection and disposal of sputum. Adult contacts are referred for X-ray, and school-going children are referred to the school clinics. All children not attending school are tuberculin jelly tested, negative reactors receiving Mantoux or a Moro test after an interval of one month. If still negative they are given B.C.G. vaccination. All positive cases resulting from any of these tests are referred for X-ray. Previously, three jelly tests were carried out over a period of nine months, and in some cases a fourth test was done after a further twelve months: but with the start of the B.C.G. campaign in July this arrangement was discontinued in favour of that described above. All infants under twelve months are referred to the Infant Welfare Department, together with the results of their tuberculin tests. They are kept under supervision and receive regular visits by the staff of that Department. Child contacts are referred to the nearest feeding centre so that they may avail themselves of the extra food provided.

Visits to patients are continued at two-monthly intervals until the patient is certified as fit for light work by the medical officer in charge of the case. Two or three further visits are made during the following six months in order to ensure that there is no relapse. Cases which are reported by the medical officer to be deteriorating or un-cooperative in following the prescribed home treatment are visited more frequently.

The primitive conditions in which most of the 'T.B. Allowance' cases live make it difficult to observe the ordinary rules of hygiene, and it is frequently impossible to apply the more stringent precautions necessary in dealing with tuberculosis. Whereas separate sleeping accommodation is most desirable for an infected person, it is often difficult to ensure even a separate

bed where a large family all live and sleep in one room or cubicle. Again, distance and poverty more often than not prevent the families of infected persons from availing themselves of such services as feeding centres etc.

Taken over the whole of 1951 the average number of new 'T.B. Allowance' cases referred to the Department each month was approximately sixty, but the figure taken over the last three months was between seventy and eighty per month.

The staff of the Rotary Clinic consists of one Health Sister and three Staff Nurse Health Visitors. The grant of transport allowance in July 1951 has enabled this staff to increase the number of visits made by about two hundred cases per month. The total number of visits made to cases and contacts during 1951 was 10,075, made up of 45.6 per cent actual tuberculosis cases, 50 per cent contacts, and 4.4 per cent wasted visits (moved and unable to trace). Approximately 20 per cent of the home visits were done in the Rural Area, the remainder being confined to the Urban Area.

Contacts of far-advanced or incurable cases are not at present investigated because the staff and equipment are worked to full capacity in supervising 'T.B. Allowance' cases. A few exceptional contacts of far-advanced cases have been referred for investigation by the medical officers or the almoners and over 90 per cent of these have been found positive to tuberculin jelly test. Due to the run on the X-ray facilities available it has been necessary of late to restrict the numbers of adult contacts referred for X-ray examination in favour of contacts of open T.B. cases.

Each Thursday afternoon a clinic is held for contacts who are dealt with as follows:—

- (i) new contacts are X-rayed and classified;
- (ii) adult observation cases (with query or slight symptoms) and active cases are transferred to the out-patients T.B. clinic;
- (iii) child contacts who are active or show slight symptoms are retained on the Department's register and are visited monthly by the health visitors. Active cases are hospitalised as beds become available.

Accommodation for child contacts found with active primary tuberculosis or progressive primary or post-primary disease is not at present adequate, and consequently many of these cases must undergo out-patient treatment. It is intended that when the 'South Winds' scheme is developed, some 50 beds (25 each for boys and girls) will become available for the more adequate treatment of these cases. In the meantime a few beds are reserved for them in Tan Tock Seng Hospital.

There is no scheme whereby children not attending school who are active or show slight symptoms of tuberculosis can obtain additional nutritional diet. This deficiency was discussed with the Almoner's Division and these children are now referred to the Social Welfare Department where they receive an allowance of milk.

The B.C.G. campaign began in July 1951, a two-day period in each month being devoted to tuberculin testing and B.C.G. vaccination. The introduction of this scheme threw additional work on the Department since all negative cases from 1949 onwards were recalled for further testing and vaccination.

CERTIFICATE FOR TUBERCULOSIS NURSING

In 1950 the Franciscan Sisters of the Divine Motherhood began recruitment of student nurses to work in the Mandalay Road section of Tan Tock Seng Hospital, and to nurse tuberculosis patients exclusively for the first two

years of their training. During this time they receive instruction along the lines laid down in the United Kingdom under the British Tuberculosis Association Regulations. At the end of this two-year period they sit for an examination based on the same syllabus and standards as those of the Association's Certificate in the United Kingdom.

In 1951, the first batch of nurses had finished their preliminary year of training and a course of lectures was started to cover the syllabus as laid down by the British Tuberculosis Association. This course will be completed by May 1952 and so enable the student nurses to take their examinations at the end of their two years of training. These nurses will then continue at the General Hospital where their two years of tuberculosis nursing will count as one year towards their training for their Singapore registration.

TUBERCULOSIS TREATMENT ALLOWANCE

Domiciliary Relief became an important and vital part of the local tuberculosis scheme for the first time in our history during 1949, following one of the main recommendations made in the Tuberculosis Policy Paper tabled in the Legislative Council in the previous year. Domiciliary relief was also given to children as part of the School Medical Service, in those cases where hospitalisation could not be arranged, at an annual cost of about \$21,000, while extras such as milk were provided to all infant welfare centres at a yearly figure of \$75,000.

All adult cases receiving relief are subject to review by a Committee operating under the auspices of the Social Welfare Department which spent \$405,000 in 1951. The School Service provides a visiting team to administer its home relief and this work is briefly reviewed in the appropriate section of this report. In the case of adults all patients are referred to the Almoner with a note from the medical officer stating whether they are medically eligible for the benefits under the scheme. Only tuberculosis patients who are in need of financial assistance and have a reasonable chance of recovery if provided with free medical treatment and sufficient funds to allow them to rest, are eligible for allowances under the scheme. Cases must have been undergoing regular treatment at any recognised hospital or in the Singapore Anti-Tuberculosis Association Clinic and must be recommended by the medical officer concerned who in addition to certifying that in his opinion they have a fair chance of recovery also recommends the number of months the allowances should be paid, which period may be extended on the further recommendation of the medical officer. The Form of Recommendation is forwarded by the Almoner of the hospital or by the Singapore Anti-Tuberculosis Association to the Department of Social Welfare, whose staff investigates the economic circumstances of the case, checking the number of dependants, the patient's former average income, and similar details. This investigation is conducted by the Public Assistance Section of the Social Welfare Department. The Supervisor of the section examines each case, assesses the need, taking into consideration income from other sources, and calculates the treatment allowance in accordance with the scheme drawn up and approved by the Advisory Committee. This detailed report is submitted and approved before a payment can be made. In many cases where policy is not involved this approval is given by the Social Welfare Department direct, being only reported to the Advisory Committee for covering approval, but where there are special circumstances calling for larger or smaller allowances, these have to be submitted to the Advisory Committee at its monthly meeting for consideration. Even in these cases an interim payment within the rates laid down can be paid,

subject to adjustment later on. All cases receiving domiciliary relief must report to the almoner and to the medical officer of the hospital for a monthly report.

When patients reach the end of the period for which their allowances were granted and they are reported to be fit to return to their former employment, or to undertake light work, the Advisory Committee, the Department of Social Welfare, and the Almoner of the Tan Tock Seng Hospital co-operate in finding suitable work for any who remain unemployed, or intercede with employers to re-employ them. The following examples indicate the rate of allowance per month:—

					\$
T.B. out-patient	...	...	...	...	45
T.B. in-patient (married)	...	...	...	...	15
(single)	...	...	...	...	5
Wife	...	...	...	...	25
Every dependant 16 and over	...	...	...	...	15
Every dependant under 16	...	...	...	...	12
Increased allowance for single person living alone	...	...	...	...	10
Rent payable	...	...	...	...	... actual rent paid
Special allowance for T.B. wife whose husband's income is very meagre:					
out-patient	...	...	...	...	35
in-patient	...	...	...	...	10

In February 1951 a high cost of living factor of 10 per cent was approved to be added to the rates as outlined above.

All rents over the limit of \$25 a month are subject to the approval of the Advisory Committee. Income from all sources, such as paid leave and wife's or dependants' income is deductible from the total treatment allowance given.

The object of the scheme is to help out the wage-earner who cannot work because of his disease; and to assist families unable to provide for sick dependants. So a new start has now been made in Singapore in one of the most essential parts of any tuberculosis scheme. The occurrence of tuberculosis in any family is a disaster. In many it is economic obliteration.

During the year over 268 patients who were drawing allowances under the scheme were certified fit for work. The average allowance paid to each case was \$70.67 per month and the average number assisted per month was 478.

The institution of 'antibiotic treatment' on out-patients widened the scope of the scheme and a larger number of rather more severe cases were regarded as eligible. This has made a temporary lag between new cases and discharges. Further, towards the end of the year the Singapore Anti-Tuberculosis Association clinic increased its scope for free treatment for patients and recommended a large number for eligibility for allowances, and this figure accounts for the higher monthly average and the slightly lower discharge rate.

A feature was the excellent co-operation between the Singapore Anti-Tuberculosis Association Clinic, Tan Tock Seng Hospital and the Social Welfare Department. This combination gave the scheme its effectiveness.

Cases considered too far advanced to be eligible for the Treatment Allowance Scheme were recommended to the Social Welfare Department for public assistance grants which are considerably lower than the rates noted above.

Thus the Government Medical Service is achieving, albeit slowly, the first phase of its Tuberculosis Policy which is as much hospitalisation plus domiciliary relief follow-up as possible: an expanded School Medical Service: an expansion in other child medical services with a concentration on feeding

and case follow-up. Children are to receive a large part of the added attention which these proposals will make possible. Dr. Morland laid particular stress on the removal of the economic penalty of tuberculosis, and suggested top priority in this respect in our approach to the problem. This advice is being kept in mind here.

Two difficulties which have to be faced are the doubtful or suspected child—the child who may develop the disease and is in a bad environment—and the chronic case for which nothing medically can be done. Neither of these categories comes into the true curative picture, although both may well be a part of domiciliary relief. A form of home sanatorium is required for the former and this is a part of the Colony's scheme where voluntary assistance will play a further important part, it is hoped. The latter may well require a special form of institutional treatment in this part of the world. The old idea of a form of 'dying house' for this sort of people is not the answer to the latter problem. In consequence, a very cheap solution is out of the question. Both these categories require removal out of a bad environment, the former as a priority towards a healthier generation, the latter as a danger removed. Both these types represent prevention as distinct from cure. So many cases of this type exist, however, in Singapore, that housing improvement is the main protection. Singapore is in large part a 'cubicle city', and where the neglect of past decades has created such slum conditions the surprising thing is that tuberculosis is not rapidly increasing. A considerable resistance must have been built up by the local population.

SURVEY BY DEPARTMENT OF SOCIAL MEDICINE ON THE VALUE AND EFFECTS OF THE TREATMENT ALLOWANCE SCHEME

In July of 1951 the Committee responsible for the administration of the Tuberculosis Treatment Allowance Scheme decided to write to the Head of the Department of Social Medicine of the University of Malaya to see if they could enlist the help of that department in attempting to assess the value of the treatment allowance scheme which had been in operation since 1949. This opportunity for research was taken up by the department and a survey commenced of the first 500 cases on the scheme. Follow-up in many cases by the clinical department had not been complete but considerable progress was made in conjunction with the University in tracing all cases. It is hoped that it will be possible to issue a report on the findings in 1952.

FURTHER NOTE ON TAN TOCK SENG HOSPITAL

<i>In-patients</i>		<i>Total treated</i>	<i>Deaths</i>
Respiratory tuberculosis	...	1,397	164
Other diseases (mostly chronic)	...	419	74
Other tubercular diseases	...	33	7
Total		1,849	245
		Percentage ...	13.25
<i>Out-patients</i>		<i>New cases</i>	<i>Repetitions</i>
ROTARY T.B. CLINIC:			
T.B. cases	...	1,936	56,471
Assessment cases	...	573	—
GENERAL O.P.D.:			
Non-T.B. cases	...	4,133	8,560
Leprosy cases	...	243	4,317

ACCOMMODATION

During 1951 the bed strength of the hospital increased from 505 to 540. The number of tuberculosis beds in the hospital remained at about 400 throughout the year but a male ward was opened in October 1951 for chronic cases transferred from the General Hospital to relieve congestion in the acute wards in that institution. Two of the remaining wards were occupied by Assistant Nurses recruited during the year and one ward only then remained empty. This is used to enable the other wards to be redecorated by removing the patients from each ward in turn.

The Diversional Therapy Department still occupies one other ward. It is hoped to build special accommodation for this essential service in 1952 and so release that ward for accommodation.

The tuberculosis out-patient attendances showed a further increase and the number of new cases referred to the Rotary clinic was slightly over the 1951 figure. Non-tuberculous attendances remained about the same. In-patients suffering from tuberculosis were 1,430 instead of 1,561. Other diseases admitted totalled 316 as the Tan Tock Seng Hospital still covers an acute in-and-out-patients duty. The number of chronic cases has had to be increased due to the lack of a more suitable institution for the care of such cases: this is the difficulty in increased turnovers.

In August the non-infectious Leprosy Out-patients Section was detached from the Skin Clinic in the General Hospital and transferred to the Tan Tock Seng Hospital where it was combined with the follow-up clinic of discharged patients from the Trafalgar Home. This operates in the afternoons.

FURTHER NOTE ON THE CHILDREN'S ORTHOPÆDIC HOSPITAL

Apart from the 138 children who were treated as in-patients at this institution during the year for various forms of bone and joint tuberculosis a number of chronic post poliomyelitis cases received attention. A factor is now the special diversionary therapy and the trained physiotherapists who visit the patients. A general nursery school was continued throughout the year for these unfortunate prolonged bed-ridden cases.

The hospital had the services of Dr. R. J. Grove-White, M.D. (Dubl.) M.R.C.P. (Ed.) as Tuberculosis Specialist throughout the year. The administration was carried out by Dr. A. L. Greenway, M.B.E., M.R.C.S., L.R.C.P. until the end of May when Dr. Grove-White took over the administration in addition to his other duties. The Department was fortunate to obtain the services of Miss G. E. L. Cummins, M.B., M.R.C.P., in January who came from England as Chest Physician following experience in Brompton Hospital and Preston Hall. In mid-December, Dr. C. E. Smith, L.M.S., (Singapore), T.D.D., (Cardiff) who had just returned from leave in the United Kingdom came to work part-time in the hospital.

In addition there were five medical officers for the first half of the year and one houseman was appointed to the hospital in July 1951. The target of the staffing of the hospital is to have two Medical Chest Units with a Senior Chest Physician and an Assistant Chest Physician, three medical officers and two housemen in each Unit. This would give sufficient time for the officers concerned to do their routine work and to begin to abstract the valuable information which has been amassed during the past four or five years. The series of pneumoperitoneum cases dealt with in this hospital alone if analysed would be one of the largest yet published and it is important to

get an accurate evaluation of our work. We believe that we have done work of real value both in the clinical and preventive fields but the pressure of work is such that the correlation of our work is virtually impossible and a great deal of valuable experience is going to waste because unrecorded and not systematically analysed.

B.C.G. CAMPAIGN

Following the signing of an agreement between U.N.I.C.E.F. and the Government of the Colony of Singapore, U.N.I.C.E.F. and W.H.O. initiated a B.C.G. inoculation campaign in the Colony in June, by sending an expert team headed by Dr. Arne Buus-Hansen. This team operated for a period of four months, and trained a number of units in the School Health Service, the Maternity and Child Welfare Centres of the Government and of the City Council, and the Kandang Kerbau Maternity Hospital. During this period 39,805 school children, pre-school children and mothers, were tuberculin tested and 15,225 negative reactors inoculated with B.C.G. The campaign was and is conducted on an entirely voluntary basis. The cost of this W.H.O. campaign was financed partly by U.N.I.C.E.F. and partly by Government.

The activities of the expert team came to an end on the 1st of October when the responsibility for continuing the campaign fell to Government. The executive responsibility for this became that of the Health Officer in charge of the Schools Tuberculosis Service.

The public response to the campaign has everywhere been good. Even with the positive form of consent, practically all accepted. Of the 18,876 negative tuberculin reactors out of total of 49,067 tested, only in 92 instances was the offer of B.C.G. inoculation refused, a percentage of 0.5. The active co-operation of the school authorities has always been an extremely valuable feature and to them must go a large measure of the credit for the success that we have been able to record so far.

For the pre-vaccination tuberculin test both mantoux and moro techniques were used, moro for those under 12 years old, and mantoux for 12 year-olds and over and all those whose skin condition was such that the moro test could not be read. The W.H.O. team read the moro tests on the third day but it was found that about 20 per cent of those negative (mainly Chinese) became positive on the fourth day and so readings were later made on the fourth day. In reading moro results three or more vesicles were considered a definite positive. In reading the results of the mantoux test any induration over three mm. was considered positive as the testing was five T.U.

In the positive mantoux reaction the infiltration in a few cases was as much as 40 mm. with vesiculation. Very few febrile reactions were recorded.

Immunisation was carried out by the intradermal injection technique. The following is a description of the technique of vaccination: the ampoule is shaken vigorously to ensure an even suspension of the bacilli. Then a one cc. syringe fitted with a special intradermal needle is filled and injection made intradermally in the deltoid region in school children until the weal reaches not less than eight and not more than ten mm. diameter. In babies 0.6 mm. was given in each arm, this being found to be the maximum which could be injected truly intradermally in such patients. Local reactions varied but in most cases a small pinpoint nodule appeared in two weeks' time. In less than ten per cent of cases this nodule became a pustule which broke down discharging a serous fluid, this finally drying in $2\frac{1}{2}$ –3 months. In only very few cases did secondary infection occur where the child had scratched the nodule. Stress was laid on the necessity for every injection being intradermal and not subcutaneous, and on the ampoule being shaken well before opening.

Quite apart from the conferment of immunity to the susceptible the campaign has benefitted our anti-tuberculosis measures in two ways. Firstly, because of the extensive mantoux and moro testing, all positive cases are X-rayed at an early date. Thus primary complexes can be detected and dealt with successfully. As contact cases are also tested in a similar manner at the Tan Tock Seng Hospital, the health visitors of that institution are further aided in their work. Secondly, the campaign has served to enhance to a considerable degree the awareness amongst all communities of the dangers of tuberculosis. This awareness may partly explain the reason for the extremely high rate of parents or guardians consenting to have their children inoculated at the first opportunity.

Whether B.C.G. does confer a substantial degree of immunity to the vaccinated is still a subject of discussion. The great difficulty is that, with one or two exceptions, there has been a general failure to realise the necessity of comparing the vaccinated infants with a control group belonging to the same social class, brought up in the same environment, and treated in exactly the same way as the vaccinated group. The work of some observers, particularly that of Levine, Vogel and Rosenburg, suggests that B.C.G. vaccination does bring about an increase in resistance to tuberculosis. The evidence, particularly of Scandinavian and American workers, suggests that vaccination is more effective if performed by the intracutaneous than by the oral route, and the degree of allergy resulting is higher. It is the former method that has been adopted in Singapore.

That B.C.G. vaccination does confer protection against the risk of dying during the earlier years of life seems to have been established by the findings of many observers. In a country where meningeal and other forms of tuberculosis is relatively high inoculation with B.C.G. offers some degree of protection, and presents a method of attack on the disease that may save numerous infant lives. What effect it will have on adult tuberculosis is less clear.

The aim is to inoculate within a period of five years all tuberculin negative mothers and children up to school leaving age. The question of re-vaccination and when this is to be attempted must be left to future observation.

No re-testing of the inoculated to obtain a tuberculin-positive conversion rate was possible during the year. Nor has it been possible to undertake a detailed analysis of the data so far accumulated. The bearing of such important factors as social class, economic groups, occupational hazards, overcrowding, etc. has on the frequency of latent tuberculosis in Singapore as revealed by the tuberculin test at least in the age—sex groups so far tested cannot be discussed. Only a general analysis on a limited number was attempted and the merit of any conclusions drawn or inferred must certainly be qualified by these statistical imperfections.

Singapore is a land in which the long hours of bright sunshine gives free play to the combined germicidal effect of ultra-violet and heat rays. Further the country is favoured by the almost daily douches of heavy downpour usually of short duration which have the effect of cleansing the atmosphere and of capturing dust and droplet nuclei and transporting them to the nearby ocean. These two factors must of themselves argue for the reduced prevalence of tubercle bacilli. Under the circumstances it would not be surprising if the percentage of tuberculin positive reactors in the various age-groups should be less than what obtains in other countries.

The tables given below are based on an analysis of the first 10,000 cards, and are presented purely for the purpose of a gross assessment at this stage. The usual system of recording as positive only those who evince an induration of at least, five mm. diameter, was not followed. On the recommendation of the U.N.I.C.E.F./W.H.O. team, every induration, over three mm. was recorded as a positive reaction. In mantoux testing only five T.U. instead of the usual ten T.U. was given intracutaneously. In consequence the percentages may in fact, express a much lower prevalence rate than is actually the case.*

Whilst the majority of these rates are derived from tests on children attending schools in some of the most congested areas of the town, they do include suburban and rural areas. Nevertheless the significance of these rates can perhaps be compared with those of Vienna and other cities. (Topley and Wilson's *Principles of Bacteriology and Immunity*. Third Edition). Even at the age of 18 years, mantoux positive reactors appear to form only 60 per cent, as compared with London with a rate of nearly 80 per cent. In Vienna, there were 91 per cent total reactors at the age of 14 years. What is perhaps even more significant is that of nearly 3,000 mothers under the age of 25 years tested only 68 per cent give a positive reaction.

Admittedly the rates obtained by this preliminary analysis are subject to many objections since they have not been broken down into economic and other groups. In addition the use of five T.U. instead of ten T.U. makes comparison difficult.

It is probable that by early adult life almost all people in the Colony have received some immunity to tuberculosis. Resistance appears to be high.

* Note:—Later 5 m. and 10 T.U. adopted on advice of Professor Frederick Heaf.

RESULTS OF TUBERCULIN TESTING FEMALES

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COLONY OF SINGAPORE

Age	MORO						MANTOUX						MORO AND MANTOUX		
	Number Tested	Positive	Per cent Positive	Negative	Not read	Per cent Not read	Number Tested	Positive	Per cent Positive	Negative	Not read	Per cent Not read	Total Tested	Per cent Positive	Per cent Not read
0—year	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1—year	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2—years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3—years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4—years	2	..	..	2	..	..	1	..	..	1	..	..	3	..	..
5—years	21	14	66.7	7	..	..	..	..	..	..	..	..	21	66.7	..
6—years	124	48	38.8	64	12	9.7	9	5	55.6	4	..	..	133	39.9	9.0
7—years	312	118	37.8	177	17	5.5	56	25	44.6	31	..	..	368	38.9	4.6
8—years	413	181	43.8	221	11	2.7	63	38	60.3	25	..	..	476	45.7	2.3
9—years	452	188	41.6	231	33	7.3	29	5	17.2	24	..	..	481	40.1	6.9
10—years	472	240	50.9	209	23	4.9	57	18	31.6	39	..	..	529	48.8	4.3
11—years	413	233	56.4	180	..	..	83	52	62.6	31	..	..	496	57.5	..
12—years	124	71	57.3	53	..	..	400	229	57.3	165	6	1.5	524	57.3	1.2
13—years	14	4	28.6	9	1	7.1	386	230	59.6	149	7	1.8	400	58.5	2.0
14—years	3	2	66.6	..	1	33.3	301	187	62.1	112	2	0.6	304	62.1	0.99
15—years	..	..	..	..	..	..	295	201	68.1	93	1	0.4	295	68.1	0.4
16—years	..	..	..	..	..	..	210	135	64.3	74	1	0.5	210	64.3	0.5
17—years	..	..	..	..	..	..	139	78	56.1	61	..	..	139	56.1	..
18—years	..	..	..	..	..	..	116	83	71.6	33	..	..	116	71.6	..
19—years	..	..	..	..	..	..	63	44	69.8	19	..	..	63	69.8	..
20—24 years	..	..	..	..	..	..	61	52	85.2	9	..	..	61	85.2	..
25—29 years	..	..	..	..	..	..	4	4	100	..	..	..	4	100	..
30—34 years	..	..	..	..	..	..	10	9	90	1	..	..	10	90	..
35—39 years	..	..	..	..	..	..	8	8	100	..	..	..	8	100	..
40—44 years	..	..	..	..	..	..	6	6	100	..	..	..	6	100	..
45—49 years	..	..	..	..	..	..	3	2	66.6	1	..	..	3	66.6	..
50—54 years	..	..	..	..	..	..	5	4	80.0	1	..	..	5	80	..
55—59 years	..	..	..	..	..	..	1	1	100	..	..	..	1	100	..
60—64 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65—years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unknown	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	2,366	1,109	62.5	1,159	98	..	2,318	1,422	50.0	6	17	..	28	57.2	..

N.B.:—Total No. of Cards .. 4,708
Total No. of Blank Cards .. 24

RESULTS OF TUBERCULIN TESTING
MALES

Age	MORO						MANTOUX						MORO AND MANTOUX		
	Number Tested	Positive	Per cent Positive	Negative	Not read	Per cent Not read	Number Tested	Positive	Per cent Positive	Negative	Not read	Positive Not read	Total Tested	Per cent Positive	Per cent Not read
0—year	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1—year	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..
2—years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3—years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4—years	6	2	33.3	4	..	..	..	..	..	..	..	..	7	28.6	..
5—years	21	5	23.8	12	4	19	..	..	..	..	..	..	21	23.8	19.0
6—years	153	61	39.9	70	22	14.4	16	5	31.3	11	..	..	169	39.1	13.0
7—years	377	142	37.7	210	25	6.6	27	5	18.5	21	1	3.7	404	28.7	6.9
8—years	465	181	39.0	262	22	4.7	44	9	20.5	34	1	2.1	509	37.3	4.5
9—years	475	198	41.7	251	26	5.5	44	13	29.5	31	..	..	519	40.7	5.0
10—years	526	252	47.9	245	29	5.5	67	24	35.8	42	1	1.5	593	46.4	5.1
11—years	582	268	46.0	273	41	7.0	92	44	48.0	48	..	..	674	46.3	6.1
12—years	121	58	48.0	58	5	4.1	538	259	54.8	235	8	1.5	659	53.6	1.9
13—years	30	20	66.6	10	..	..	469	285	60.8	175	9	1.7	499	61.1	1.8
14—years	23	14	60.9	9	..	..	386	236	61.1	144	6	1.6	259	63.6	1.5
15—years	10	7	70.0	3	..	..	306	176	57.5	125	5	1.6	316	57.9	1.6
16—years	5	3	60.0	2	..	..	179	118	65.9	59	2	1.1	184	65.8	1.2
17—years	..	..	..	..	..	..	120	72	60.0	47	1	0.8	120	60.0	0.8
18—years	..	..	..	..	..	..	68	39	57.4	27	2	3.0	68	57.3	2.9
19—years	..	..	..	..	..	..	48	38	79.2	10	..	..	48	79.2	..
20—24 years	..	..	..	1	..	..	54	38	70.4	13	3	5.5	55	69.1	5.5
25—29 years	1	..	..	..	..	..	23	16	69.6	6	1	1.4	23	69.6	4.4
30—34 years	..	..	..	..	..	..	10	10	100	..	..	..	10	100	..
35—39 years	..	..	..	..	..	..	13	12	97.0	..	1	7.7	13	92.3	7.7
40—44 years	..	..	..	..	..	..	9	9	100	..	..	..	9	100	..
45—49 years	..	..	..	..	..	..	12	12	100	..	..	..	12	100	..
50—54 years	..	..	..	..	..	..	1	1	100	..	..	..	1	100	..
55—59 years	..	..	..	..	..	..	1	1	100	..	..	..	1	100	..
60—64 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65— years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unknown	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	2,785	1,214	..	1,397	174	..	2,531	1,459	..	1,031	41	..	5,316	..	..

N.B.:—Total No. of Cards .. 5,340
Total No. of Blank Cards .. 24

CHAPTER TWENTY-ONE

VENEREAL DISEASE

A STEADY progress has been maintained in the various activities of this division throughout the year and the hospital and clinics provided for the purpose were fully stretched to meet the steadily growing public pressure on the existing accommodation and staff in this direction as in others. The laboratory attached to the Dock Area Clinic was fitted with tarazzo marble work-benches and equipped for the carrying out of the quantitative kahn test. It is further intended to use cardiolipin antigen in due course. Another new feature has been the establishment of a separate skin clinic in the Middle Road Hospital for the daily treatment of dermatological complaints of venereal cases. The travelling dispensary introduced towards the end of last year proved of very great assistance in finding and treating new cases in the suburban and rural areas of the Colony, and in administering continuous treatment to old cases discharged from the hospital. Its scientific contribution has been in initiating surveys amongst ante-natal women in rural clinics and in under-privileged children in the Social Welfare institutions by routine blood tests. At least some of the decrease noted in the incidence of fresh infections can be attributed to the voluntary antibiotic prophylaxis of prostitutes begun in 1950. The improved epidemiological control (contact service) during 1950 and 1951 has paid handsome dividends in the remarkable decrease in the defaulter rate, resulting not only in an all time high of total attendances, but also in diminishing fresh syphilitic infections.

Notable progress has been made in the educational activities of the division. In addition to the usual training of students of the University of Malaya, a course of lectures has been organised for male nurses, and nurses of both sexes have been attached to the Social Hygiene hospital and its clinics for practical training. Propaganda talks were given to the personnel in the Government Social Welfare Department, and a useful contribution was made to the International Student Service Conference held in Singapore early in the year. In the latter part of the year the hospital and its clinics were visited by a group of Indonesian medical officers and nurses on a W.H.O. study tour of public health organisations. Several interesting clinical cases have been presented to local clinico-pathological meetings. The following scientific contributions were made to the local medical press during the year:—

- (i) Lymphogranuloma Inguinales in Singapore.
- (ii) Infantile eyphilis in Singapore.

ATTENDANCES

The following table shows the number of new in-patients, out-patients and total attendances during the last five years:—

<i>Year</i>		<i>In-patients</i>	<i>Out-patients</i>	<i>Total Attendances</i>
1947	...	2,129	10,605 (2,540 females)	44,990
1948	...	2,478	12,986 (3,047 females)	72,913
1949	...	2,221	14,478 (3,721 females)	96,258
1950	...	2,555	15,249 (3,884 females)	105,592
1951	...	2,633	15,958 (4,794 females)	124,830

The type of in-patient seeking admission to the hospital has considerably changed during this period. In earlier years the hospital was chiefly used as a 'rapid treatment centre' for three hourly penicillin injections. Since the introduction of procain penicillin in oil with aluminium monostearate and the travelling dispensary service the number of such cases has naturally diminished. More men and women have sought admission for investigation and exclusion



Public Relations

Display of articles made by Diversional Therapy Unit



Public Relations

Rotary Government Tuberculosis Clinic



Public Relations

Part of the Out-patient Department, Kandang Kerbau

of venereal disease, especially when suffering from an acute or chronic skin ailment, or non-specific discharges. Similarly, a much larger number of latent syphilitics, and patients with later complications such as gummatous ulcerations, tabes, G. P. I. and other neurosyphilis and joint complications, have been admitted during the last two years, with the result that a hospital bed had been occupied for a much longer period than in previous years and consequently the turn-over of the patients should have been much less than in 1948 and 1949. In spite of this however more patients were admitted and over 2,600 in-patients were treated. This result has been achieved by improvised stop-gap arrangements till the envisaged Medical Plan can be implemented. Facilities have been provided for discharged male patients so that these can apply any time for treatment in between the clinic hours and the travelling dispensary took charge of many prematurely discharged cases of women and children from rural areas. Thus the patient as far as possible has not been allowed to suffer though the staff no doubt has been overworked, as is further evidenced by increased work in the out-patient clinics due to the phenomenal rise in total attendances.

INCIDENCE OF VENEREAL DISEASES

The first year of the half century appears to be an opportune moment to review the position with regard to prevalence of venereal disease in Singapore. Venereal disease as a separate speciality made its debut here in 1926, when free clinics were organised. In 1930 brothels were abolished. Both these innovations were strongly objected to by a section of the general public, including some eminent medical personalities of the time. The argument was set forth that the Asian did not care for or indeed believe in anything that was given free: thus that the closure of brothels would let loose the girls on the street and so endanger public health by indiscriminate dissemination of disease.

In 1930 the population of Singapore was just over half a million and the venereal disease infections reported in Singapore clinics numbered 17,726. In 1938, when the population rose to 710,037 the number of such infections had dropped to 10,176. Syphilitic infections had a steep fall from 8,252 to 2,809 and others from 9,474 to 7,367. This spectacular decline especially in syphilitic infections, would not appear to have justified the morbid expectations of the pessimists of the early thirties.

The following table shows the number of venereal disease infections reported to this department during the last three years when the population of Singapore has been just about or above the million mark:—

<i>Year</i>		<i>Syphilitic Infections</i>	<i>Other V.D. Infections</i>	<i>Total</i>
1949	...	4,575	5,885	10,460
1950	...	3,137	5,656	8,793
1951	...	2,512	5,275	7,787

Dr. L. M. Ram, M.B., B.S., M.R.C.P. (Ed.) D.P.H. (Lond.), the Senior Medical Officer in charge of Singapore's Venereal Disease Division sums up the situation as follows:—

It is evident when the population figure is taken into consideration that there has been over a four-fold reduction in venereal disease infections since 1930. There has been a drop of 45 per cent in syphilitic infections and of 10 per cent in other venereal disease since 1949.

He goes on to remark on the post-war organisation:—

The satisfactory results achieved have to a great extent been due to some radical changes effected in the post-war era in the re-organisation of the department. Administratively, the most important step was the setting-up of the division as a completely independent unit with its own 70-bedded hospital and clinics. The arrangement allowed the hospital for use as a rapid treatment centre for three hourly administration of penicillin, thus quarantining the infectious cases by treatment, rendering them sterile and stopping further dissemination of the

disease. Another equally important measure was the introduction of epidemiological control under a senior lady supervisor and two, and later nine, lady assistants who followed the cases after discharge and induced them by home visits to continue further treatment and examinations, and persuaded them to bring their children and other contacts for examination and if infected for treatment. This branch too was located at the Social Hygiene Hospital and was responsible for establishing and maintaining liaison with various Social Welfare agencies, the Labour Department, and Service and Civilian Police Departments. Legislative help was sought to get the Social Hygiene Hospital gazetted as a proper place for the detention of "minor" girls under the Women and Girls Protection Ordinance, so that such girls referred by Social Welfare and other departments could if necessary be detained, examined, and if infected, treated before transfer to Social Welfare and Salvation Army Homes for rehabilitation and follow-up.

This centralisation of all diagnostic, therapeutic, and control measures in one institution has tremendously enhanced the educational value of the department, where increasing numbers have been reporting each year, just for check-ups for a clean bill of health. Such an organisation is ideal for a large city like Singapore. For smaller towns requisite modification might be required.

THE TRAVELLING DISPENSARY

This service, inaugurated in November 1950, is yet another post-war innovation. It was realised soon after the re-occupation that one of the limiting factors of attendances at the City Clinics by suburban patients was the time consumed in travelling, and the economic wastage entailed both in neglect of regular work and in the extra expense incurred in fares. Moreover without routine blood tests in ante-natal cases it was not possible to prevent congenital syphilis. These disabilities were to a large extent overcome by the Social Hygiene Travelling Dispensary which is a self-contained unit where blood and smears can be taken and where sterilisation of instruments and so on can be done in the van itself. In practice however we have been much more fortunate in that with the co-operation of our ante-natal clinics and local communities the work has been carried on either in the clinics or in local club houses. The following table shows the number of localities visited and new cases examined in 1951:—

Clinic	NEW CASES		No. of Ante-natals	V.D. Cases	Investigation Cases	Total
	Male	Female				
<i>Central Rural</i>						
Yio Chu Kang	82	673	507	64	691	755
Upper Serangoon						
Seletar						
Paya Lebar						
<i>Rural West</i>						
Bukit Timah	141	630	520	63	708	771
Pasir Panjang						
Lim Chu Kang						
Lam San Village						
Bukit Panjang						
<i>Rural East</i>						
Changi	38	454	336	45	447	492
Ulu Bedok						
Kampong Batak						
<i>Homes and Schools</i>						
Bukit Timah Boys Home	357	..	..	19	338	357
Thomson Road Boys Home						
Mt. Emily Boys Home						
Pasir Panjang Ch. Home						
Chua Chu Kang School						
Total	618	1,757	1,363	191	2,184	2,375

191 venereal cases which otherwise would have remained unknown were thus uncovered. The paucity of male patients is due to the fact that in rural areas most of the men are busy during the day in their fields, or are out on the sea for fishing.

The number of old cases discharged from the Social Hygiene hospital and treated by this Service in various centres was:—

<i>Clinics</i>			<i>Syphilis</i>	<i>G.C.</i>	<i>Total</i>	
CENTRAL						
Yio Chu Kang	}	109	19	128
Upper Serangoon						
Seletar	82	5	87
RURAL WEST						
Bukit Timah	252	25	277
Pasir Panjang	50	3	53
RURAL EAST						
Changi	}	240	4	244
Ulu Bedok						
Kampong Batak						
				<hr/>	<hr/>	<hr/>
				733	56	789

These 789 patients who otherwise would have been defaulters were thus enabled to continue their treatment to completion. Thus they not only prevented a further spread of disease, but were protected from later crippling complications.

BLOOD TEST SURVEYS

The scientific contribution of this service has been no less. Every public health administrator wants to know the incidence and prevalence of a disease in an area before he can recommend with conviction the measures for its eradication or control. The following table shows by nationality the number of ante-natal cases examined, the number found positive on routine blood test, and whether the woman was a primipara or a multipara at the time of first examination.

Nationality				No. of Ante-natals	Primi-para	Primipara positive	Multi-para	Multipara positive
Chinese	..	..	..	936	522	12	414	32
Indian	..	..	..	110	46	3	64	4
Malaysian	..	..	..	313	174	7	139	15
Others	..	..	..	4	1	..	3	..
				1,363	743	22	620	51
				Percentage Positive 3%				Percentage Positive 8.2%
				Percentage Positive=5.4%				

This figure of 5.4 per cent although derived from suburban and rural cases could be taken as applicable to the whole of Singapore as it more or less corresponds with the results obtained in Asian male donors in the Transfusion Department during the last four years (6%–7%).

The children in Social Welfare homes numbered 351, of whom 19 were found to be suffering from congenital syphilis i.e. 5.4 per cent. This figure refers to under-privileged children only. The rate for students in ordinary schools is not known but should be less.

ANTIBIOTIC PROPHYLAXIS OF PROSTITUTES

Another post-war measure has been the attempt to try to keep the infected or infectable individual free of infectious lesions for as long a time as possible by a sort of continued treatment. The Contagious Disease (Women) Ordinance was promulgated in Singapore in 1872. Under this every brothel and every inmate was registered and it was reported in 1886 that 2,638 women constituting about 90 per cent of all prostitutes were on the register. Even then the Military Surgeon always complained of a good deal of sickness amongst the troops. This Ordinance was repealed by the Secretary of State in 1888 and the Burleigh Committee in 1927 stated:—

The declared policy of His Majesty's Government in Great Britain and in the Dominions is contrary to any form of official regulation of prostitution and it appears to us to be very undesirable that any countenance should be given to the view that any departure from the policy can be contemplated in other parts of the British Empire.

Brothels as mentioned above were abolished in Singapore in 1930.

Singapore law and custom forbids the operation of brothels, and repression of prostitution has been observed with some diligence. According to the Annual Report of the Police Department of the Colony (1948), the estimated number of prostitutes in Singapore was then 3,500, of whom only 180 were supposed to be street walkers. An analysis of the source of infection in the male patients revealed the fact that a large majority of men was infected by such women of no fixed abode. With the availability of P.A.M.,* renewed efforts were made with the co-operation of Service and civilian police, and the Social Welfare Agencies and Labour Department, leading to an important segment of this population reporting more or less regularly, once a week, for examination and treatment. Sympathetic handling by medical officers and the clinic staff soon gained the confidence of these patients. Not only that, but about 60 per cent either sought admission for a complete course or decided to report daily to the out-patient clinic till cured, and remained willingly under surveillance. In at least a dozen instances such self respect was restored that matrimony was entered into without qualms. The number of such promiscuous women, who are all voluntary patients has risen from 117 at the end of 1950 to 258 in 1951. It may be of interest to mention that very few of these women have been found re-infected. No woman referred as a source of infection has again been responsible for new infections of gonorrhœa or syphilis, although about half a dozen have been reported as a source of non-specific urethritis.

The indirect effect of this procedure has been that more and more of such women have been attending the clinics of private practitioners, and perhaps thus at least keeping the infectious lesions under control. (It is suspected that a large number of such women attend the clinics of the 204 private practitioners in the City).

Its usefulness is also reflected in the smaller number of primary and secondary infections reported in the clinics which has fallen from 2,508 in 1947 to 945 in 1951.

Dr. Ram suggests that this administrative measure was responsible for reducing the number of fresh infections because it helped in carrying penicillin to a section of the population, however small in number, which was mostly responsible for fresh infections.

* Penicillin G in oil with Aluminium Monostearate.

EPIDEMIOLOGICAL SERVICE

(Contact Investigation)

The staff of this service now consists of one senior lady supervisor and nine lady assistants. With increased staff the number of visits to defaulters has risen from 5,006 in 1950 to 8,229 in 1951. 35.5 per cent or 2,924 of these visits led to complete success. Propaganda visits were made to 928 new homes (342 in 1950). 618 families in Singapore and 166 cases from the Social Welfare Department were screened during the year.

How the efforts of this service have succeeded in reducing the defaulter rate is worth recording. In 1937 out of 404 cases of early syphilis in the Bencoolen Street Clinic in Singapore, only 42 completed one course of nine injections of Bismuth and Arsenic—a defaulter rate of 89 per cent. The figures were still worse for those early cases with a positive blood finding i.e. early latent cases where infection was of less than four years duration, when only five out of 478 cases completed this minimum treatment. With the advent of penicillin the defaulter rate fell as follows:—

					<i>Per cent</i>
1947	...	...	...	...	78
1948	...	...	...	...	73
1949	...	...	...	...	71

With the re-organisation of the department in 1950 and the introduction of Penicillin Aluminium Monostearate:—

					<i>Per cent</i>
1950	...	...	...	...	58
1951	...	...	...	...	25

The 25 per cent were people who could not be contacted. They had either given wrong addresses, had moved to some other locality, had gone to private practitioners, had emigrated to the Federation of Malaya, or were local and foreign sailors. Only a very few were anti-social and could not be persuaded to report for examination.

GONORRHOEA

The following table shows the incidence of gonorrhœa during the last three years:—

<i>Year</i>		<i>Gonorrhoea</i>	<i>Gon. Ophthalmia (Infants)</i>	<i>Gon. Complications</i>	<i>Total</i>
1949	...	3,207	133	238	3,578
1950	...	3,209	86	192	3,478
1951	...	2,816	49	90	2,955

There has been a reduction in incidence and complications in clinic cases, by 18 per cent since 1949. The modern treatment of uncomplicated gonorrhœa has become so simple that more and more cases are being treated by general practitioners, and the effectiveness of treatment is evidenced by the lowered figures for gonorrhœa ophthalmia in infants and gonorrhœa complications. But this is not the whole story. As was pointed out last year 'non specific urethritis' which at present seems to be on the increase appears to be the disease of the future. Frequent re-infection in the same individual is another problem. American statistics of 21 large cities which include cases reported by private physicians do not allow of much optimism, as the following figures from five well known cities show:—

<i>Name of City</i>		<i>Number of cases</i>	<i>Number of cases</i>
		<i>1941</i>	<i>1950</i>
Boston	...	1,170	1,631
Chicago	...	12,588	17,547
Los Angeles	...	5,512	7,146
New York	...	14,720	17,861
Washington, D.C.	...	3,407	15,231

Public Health control of gonorrhœa appears to be as elusive as ever. With easier and more efficient treatment the incidence is still on the increase in countries where better methods of observation prevail. The problem in Singapore is no easier. There were 2,533 new male cases of gonorrhœa treated in 1951. 142 or 5.6 per cent relapsed and had to be retreated. 183 or over 7 per cent were accompanied with non-specific urethritis as well and their treatment was a prolonged one. 417 or nearly 17 per cent had 2—8 attacks by re-infections. Thus there seems to be ample justification for keeping a case of gonorrhœa under surveillance for at least three months and not losing sight of him after a dose of P.A.M.

NON-SPECIFIC URETHRITIS

Although in this report this infection is included under investigations of non-V.D. cases, the Army continues to list it as a venereal disease under a separate heading. 192 primary infections have been recorded in the male sections during the year as against 31 in 1950. As mentioned above 183 cases of gonorrhœa had this complication as well, bringing the total to 375 cases. The incidence among women patients is unknown, but the wife of a married man suffering from this disease is contacted and treated as well.

Harkness states that between 1921—1939, the incidence of non-gonococcal urethritis varied from 17 per cent to 21 per cent in his series of all cases of urethritis, and since 1939 it has been 31 per cent. A similar figure was given by Pelouze in his series of 1,083 cases of urethritis published in 1941 (30.8 per cent). Worcester who was Senior Medical Officer to the Australian Forces in Borneo during the war put the figure at about 80 per cent. These latter infections were contracted from Malay and Chinese women.

There is little doubt that the percentage of such cases is much higher than the 14 per cent of urethritis cases met with in this department, but the symptoms are so mild in the majority that the poorer classes do not worry very much about them. Many of the cases do not yield to antibiotics alone, but require the older treatment of irrigation, and dilatation and prostatic massage in addition. This has put a heavy extra strain on the resources of our overcrowded and cramped Middle Road Hospital male clinic. The treatment has become costly too, as all antibiotics except penicillin are quite expensive.

SYPHILIS

Dr. Ram has this to say about this disease:—

Syphilis has always been much easier to control than gonorrhœa, possibly because the syphilis of the established prostitute is past the infectious stage or can be easily kept controlled by treatment. It was controlled both in the British and German armies in the latter half of the 19th century by cleanliness, discipline and administrative measures *alone*, when even the causative organism was unknown and no modern drugs were available.

Except for the immediate post-war period it has been declining steadily in Singapore, and now with better organisation and better remedies the incidence may well be further lowered. It is still about six times more prevalent than in European countries like the United Kingdom. It is estimated by syphilologists that in about twenty per cent of infected men and thirty per cent of infected women the infection is latent from the start, and it is this reservoir that has to be constantly found and treated. More people are presenting themselves voluntarily for blood tests, and the epidemiological service as stated above, by following the contacts, is really contributing a great deal towards the control of this malady by finding unsuspected new cases.

CONGENITAL SYPHILIS

Although more cases of this nature have been treated during the year than in 1950, it is interesting to note the reduction in the reported incidence of infantile syphilis in 1951, only 70 such cases having been treated in Middle Road Hospital and 5 in the General Hospital as compared with 117 and 20 respectively in 1950—a reduction of over 45 per cent. The Travelling Dispensary Service alone was responsible for discovering and treating 73 syphilitic mothers during routine ante-natal testing. Thus it saved many infants who otherwise might have been syphilitics. Many more pregnant women have been treated in Middle Road Hospital.

TERTIARY SYPHILIS (LATE SYMPTOMATIC SYPHILIS)

As yet no reduction can be reported in this type of late syphilis. There were 375 cases so diagnosed as against 306 in 1950.

The following table gives the breakdown by type of disease, nationality and sex:—

Nationality	Gam- mata and Skin	Bones and Joints	Cardio- vascular	G.P.I.	Tabes	Other Neuro- syphilis	Total
Males							
Chinese ..	45	82	17	7	26	54	231
Indian ..	8	36	2	3	2	13	64
Malaysian ..	9	11	1	..	..	4	25
Others ..	..	1	1	1	1	1	5
FEMALES							
Chinese ..	6	4	3	1	2	23	39
Indian ..	3	..	..	..	..	1	4
Malaysian ..	3	..	2	..	..	..	5
Others ..	..	..	1	..	..	1	2
Total Male and Female	74	134	27	12	31	97	375

The ratio of various lesions has been:—

	1950	1951	
	Per cent	Per cent	
Neuro-syphilis	35.6	37.3	
Cardio-vascular	10.8	7.2	
Cutaneous	29.7	19.7	} Benign.
Bones and Joints	23.9	35.8	

Benign lesions constituted 55.5 per cent and neuro and cardio-vascular 44.5 per cent.

The ratio appears to be more or less the same for the two years.

SYPHILIS (PERIOD NOT INDICATED)

This group increased in number due to better case-finding technique. It includes cases of early latent and late latent syphilis where except for the positive blood test no other abnormality can be detected in any other system. All cases where the infection is of 1—4 years duration, or when

persons are below the age of 25 years, are entered as early latent syphilis. Such cases are a danger to public health as they are very infectious and so treatment has to be vigorous. The late latent group comprises cases of more than 4 years duration. These are generally non-infectious. Here the treatment concerns the individual more than his danger of spreading disease. But a woman during her child-bearing period has to be treated as an acute case because of the possibility of infecting the unborn child (foetus). The following table gives details of 1,018 such cases according to nationality and sex in 1951:—

Nationality	MALES			FEMALES		
	EARLY	LATE	Total	EARLY	LATE	Total
	Latent	Latent		Latent	Latent	
Chinese	119	238	357	83	209	292
Indian	38	107	145	14	28	42
Malaysian	33	35	68	23	67	90
Eurasian	2	2	4	2	4	6
European	1	1	2	..	..	..
Others	2	7	9	2	1	3
Total ..	195	390	585	124	309	433

319 or over 31 per cent of such cases were of early latent syphilis.

SEAMEN

New seamen patients seeking treatment by the department have remained below the thousand mark during the last 3 years:—

1949	...	...	...	862
1950	...	...	...	939
1951	...	...	...	831

The Brussels Agreement, or, to give it its full title, the 'Agreement respecting facilities to be given to Merchant Seamen for the treatment of Venereal Disease', is adhered to by Singapore. It may be of interest to note that many countries in the Far East have neither signed, ratified nor adhered to it.

The following table gives details by nationality:—

MIDDLE ROAD AND DOCK AREA CLINICS

	Primary	Secondary	Tertiary	P.N.I.	Gonorrhoea	Gon. Opthalm	Gon. Compl.	Soft Chancre	Lymphogranu	Mixed Infec.	Non-venereal	Total
Chinese	24	12	15	26	50	2	35	13	10	187	116	303
Indian	3	..	..	..	3	1	3	..	..	10	9	19
Malaysian	6	4	2	6	33	2	9	1	8	71	30	101
Eurasian .. ..	..	..	..	1	1	..	..	..	..	2	1	3
European	3	..	..	1	59	2	40	1	..	106	260	366
Others	3	..	..	2	13	..	6	1	8	25	14	39
Total ..	39	16	17	36	159	7	93	16	26	401	430	831

ROUTINE WORK IN THE CLINICS

This is still on the increase due perhaps to better education of the public. As mentioned above people are becoming 'V.D. conscious' and report for examination to exclude such diseases. Hence the number of kahn tests and smears is still on the increase although the number of venereal cases has actually been less than in any previous year. The only decrease registered is in the number of total injections given which is mainly due to the introduction of P.A.M. So the three hourly injections of penicillin have diminished. The following table indicates some of the work done during the last three years in this connection:—

		1949	1950	1951
1. Blood Specimen for Kahn Tests	..	15,339	22,585	26,765
2. C.S.F. Examination and Kahn and W.R.	..	78	638	786
3. Dark Ground Specimens	.. ..	4,810	7,192	4,797
4. Smears for Gonorrhœa	.. ..	9,046	11,381	13,208
5. No. of Total Injections	.. ..	169,563	184,921	165,225
(i) Aquea penicillin G. used	.. ..	6,319 mu	6,140 mu	5,438
(ii) Procain penicillin in oil with aluminium monostearate	.. ..	2,202 mu	11,903 mu	22,349
(iii) Arsenical Injections	.. ..	24,045	28,103	26,786
(iv) Bismuth Injections	.. ..	21,670	22,880	21,480
6. Gonorrhœa for Culture	.. ..	..	257	333

OTHER VENEREAL DISEASES

1. *Granuloma Inguinale*

For the last three consecutive years no indigenous case of this malady has been recorded. The only plausible explanation appears to be restriction on immigration of unskilled labour from Southern India and Southern China.

2. *Lymphogranuloma Inguinale*

Though very amenable to treatment with sulfa drugs, T.A.B. vaccine and anthiomaline, the incidence of this condition appears to be unaffected unless it be conceded that more people of the labouring classes are seeking treatment in Social Hygiene Clinics. The figures for the last three years have been as follows:

Year	Number of cases			
1949	143
1950	223
1951	233

It is true that cases with discharging sinuses lasting for months have become a rarity. Some apparent increase might be attributable to early and better diagnostic techniques.

3. *Soft Sore*

Since the introduction of sulfa drugs this condition has become a minor disease with infrequent fluctuating buboes, but its incidence has been little affected as is revealed by the figures for the last three years:

<i>Year</i>					<i>Number of cases</i>
1949	...	...	...	...	1,796
1950	...	...	...	...	1,494
1951	...	...	...	...	1,600

Cleanliness and sexual hygiene play a greater part in the prevention of the last two diseases than even in the prevention of syphilis and gonorrhœa. Education of the working classes to this end appears to be indicated.

4. *Mixed Infections*

It is still considered to be advisable to consider these as a separate group. All patients who on their first admission are found to be suffering from more than one venereal disease have been so classified to avoid reduplication of reported cases. These cases are in addition to the cases of gonorrhœa and syphilis mentioned so far. The number of such infections for the last three years has been:—

1949	...	...	...	...	368
1950	...	...	...	...	472
1951	...	...	...	...	487

The breakdown is shown in the following table:—

			Gon. with Syph. I	Gon. with Syph. II	Gon. with E.L.	Gon. with L.L.	Chancroid W Syph. III	Chancroid W Syph. E.I.L.	Chancroid W Syph. L.L.	Chancroid W Gon.	L.I. with E.L.	L.L. with E.L.	Chancroid W Syph. I.	Total
Chinese	..	..	6	12	95	88	3	38	24	11	5	6	1	289
Indian	..	..	2	5	38	32	1	18	13	10	4	1	..	124
Malaysian	..	..	1	1	32	16	1	9	..	2	6	..	..	68
Eurasian	..	..	..	..	..	..	..	..	..	1	..	..	..	1
European	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Others	..	..	..	..	..	1	..	1	1	..	1	..	1	4
Total	..	..	9	18	165	137	5	66	38	24	16	7	2	487

463 of these patients were suffering from syphilis:—

Primary syphilis	11	} Early Syphilis.
Secondary syphilis	...	...	...	18
Early Latent syphilis	...	...	...	247
Late Latent syphilis	182	} Late Syphilis.
Tertiary syphilis	...	...	...	5

353 of these patients had gonorrhœa as well.

INVESTIGATION CASES

Out of a total of 15,958 new cases treated during the year no less than 8,171 or 51 per cent proved to be non-venereal. In England and Wales in 1949 such cases constituted over 68 per cent of all cases in venereal clinics. The breakdown of the cases was as follows:—

	1950	1951
Apprehensive group including ante-natal and contact cases	2,802	4,711
Dermatological complaints	1,720	1,652
Arthritis and arthralgias	713	451
Non-gonococcal urethritis, cervicitis, trichomonas infestation, dysuria, haematuria, etc.	654	604
Other genital infections—balanitis, Warts, paraphimosis, traumatic, ulcers, hydrocele, non-specific epididymitis, and sexual complaints	344	290
Yaws	56	118
Leprosy	18	15
Non-venereal Iritis conjunctivitis	39	45
Miscellaneous	110	285
	<hr/> 6,456	<hr/> 8,171

Venereal disease clinics throughout the world serve both as clearing houses as well as treatment centres for various allied complaints which appear in the patient to be of venereal origin but are not necessarily venereal disease. Just as infant mortality or incidence of malaria in tropical countries is considered to be an index of good sanitation and public health activity in an area, similarly the venereal disease control and propaganda index may well be judged in future by the number of patients *reporting* to a venereal disease centre for investigation to be eventually diagnosed as non-venereal disease.

The attached tables show details of venereal disease treated and total attendances, with a classification of nationalities during the year 1951.

A study of the figures and tables included in this short report should make it abundantly clear that the steady advance in the number of cases coming up for treatment reported previously has continued into 1951. In fact this year can be stated to be an all-time record in this respect. This is an excellent effort in view of the limited accommodation and small staff available.

Under the Medical Plan the present organisation will be more than doubled, but it is impossible to accommodate more in-patients at present. The three full-time and two part-time doctors available have their hands more than full in dealing with the present numbers. Under the Medical Plan the out-patient facilities will be considerably improved and increased, while in-patient accommodation will rise from the present 70 beds to at least 120. It must be stressed again that comparative increases do not necessarily mean an increase in the incidence of the disease in Singapore, but to new methods of approach and treatment. These are bringing more and more patients forward. The time has come in fact when present arrangements are proving inadequate to meet the public demand in this direction. In the meantime in consequence more attention will be paid to evening clinics and to the travelling dispensary scheme arranged for the rural districts but on an experimental basis so far.

Within the limits of staff and accommodation available the venereal disease campaign in Singapore can be said to have met with a definite success. Far more is being done today to combat the disease than ever before. A tremendous amount remains to be done of course. It is still the contention that progress should be on the present lines—a scheme founded on persuasion and confidence between the patient and the doctor. Compulsory notification and segregation have been advocated again and again, but these ideas do not meet with favour by those who have to deal with the problem locally. Measures of force would mean the immediate destruction of the present scheme, and loss of confidence in the classes most concerned. Accommodation would have to be of a definite prison nature and would without doubt necessitate a very large staff. So a steady advance on present lines is advocated as far as the medical side of the problem is concerned:—

The following extract from the 1949 Ministry of Health Report is still relevant:—

It is still too early to say to what extent, if any, the fall in the number of new infections of both syphilis and gonorrhoea treated in the clinics is due to the almost universal use of penicillin or whether it is largely, if not entirely, consequent on the return of peacetime conditions. So simple is the modern treatment of gonorrhoea that it is possible that more cases of this disease are now treated by private practitioners than formerly but there is no evidence that this is the case with syphilis. It must not be forgotten, however, that in 1948 the clinic incidence of early syphilis was still more than twice what it was in 1939, but there will be every cause for satisfaction if the present rate of decline can be maintained or even approached during the next two years.

Procaine penicillin is being used to an increasing extent for the ambulant treatment of syphilis in all its stages and seems to be fulfilling its early promise as an effective agent for the treatment of early infections. Excellent results from its use are also being obtained in pre-natal and congenital cases as well as many of the manifestations of late syphilis (including neuro-syphilis). Though it is still impossible to know whether the ultimate results of penicillin in late syphilis will excel or even equal those attained in the past with arsenicals and bismuth, many workers are making use of it to an increasing extent, either alone or in combination with reduced amounts of these time honoured drugs.

SOCIAL WORK

There is a growing appreciation of the fact that no clinic can be considered complete without its 'social side'. The venereal diseases are social diseases par excellence and the services of a trained social worker should be at the disposal of every doctor engaged in their treatment. Thus only can the difficulties which beset so many patients be resolved and the ever present tendency to default corrected. An increasing interest is being taken in the problem of contact tracing and the help of the social workers on the staffs of medical officers of health is appreciated. Their assistance is particularly useful when the contact is at a distance or the patient otherwise unable or unwilling to co-operate. It is, however, the opinion of many clinic doctors that the patient, properly handled, is often the most effective contact tracer. Much infection is spread by the persistently promiscuous, who too often can give but a vague geographical clue to the resort of their contact and none as to their identity. This is particularly so in the case of the patient with syphilis, whose short memory is not helped by the long incubation period. Painstaking efforts on the part of both doctor and social worker will sometimes secure a contact on the flimsiest of evidence, but in great cities such consorts are often impossible to trace.

TREATMENT

Gonorrhæa. Amongst the several medical miracles of the 20th century, the continued susceptibility of the gonococcus to penicillin has undoubtedly been an outstanding one. In over 6,000 cases of acute gonococcal urethritis treated during the last two years in the Social Hygiene Department, there has been an unfailing response to an injection of 300,000 units of Procain

Penicillin in Oil with Aluminium Monostearate. It is believed that about 90 per cent of actively multiplying organisms are killed directly by penicillin and the benumbed 10 per cent become an easy prey to the immunological processes of the host. In about 5 per cent of cases only all the benumbed ones do not seem to be adequately dealt with by the individual, and begin to multiply again after a lag period of a few days or weeks causing a relapse which responds equally well to another shot of penicillin. Those complicated with non-specific urethritis never clear up with this treatment but yield to different therapeutic measures. Nor is the response to penicillin so dramatic in complications such as arthritis and epididymitis. Needless to state, such complications are becoming rarer. Occasionally a case of salpingitis is met with in the female, but extensive formation of warts in vulva and vagina and bartholinitis are still quite common, due perhaps to neglect and ignorance.

Non-specific Urethritis. So far, this has constituted about 10 per cent of clinic cases, but there is no doubt that it is very prevalent in Singapore, as more and more cases of this type are being referred to the department by private practitioners after prolonged courses of penicillin, streptomycin, chloromycetin and aureomycin. In our experience all these clear up on mild low-pressure irrigations and dilatations. These are the cases that still require the classical investigation with sounds, urethroscope and prostatic massage. The treatment of such is essential as they are liable to develop the same complications as cases of gonorrhœa. Once well treated there is seldom any relapse. The ætiology is unknown but it is believed by some European authorities that virus or 'L' organisms might be the causative agents.

Syphilis. Except in certain cases in rural areas where weekly or bi-weekly P.A.M. has to be given, the general routine course in the clinics consists of 6 mega units of P.A.M.—2 ccs every day for 10 days—followed by a course of weekly Bismuth for 10 weeks and 5 Mapharsen (0.04G. daily) injections. Fewer relapses and a diminished chance of re-infection are two great advantages of such a combined course in Singapore, where most husbands prefer to be treated by a private practitioner, but refer their wives and children to this department. Infants are treated with penicillin alone. The tertiary cases are more individualised, but both cardio-vascular and neurosyphilis patients are treated with penicillin without preparation with a heavy metal. Pot. Iodide still has a place in therapeutics in late syphilis both in ameliorating pain and rapid resolution of pathology.

Lymphogranuloma. Sulpha drugs, T.A.B. vaccine injections, anthiomaline and aureomycin (in esthiomene cases in females) have cured practically all of our cases. Aureomycin has been very useful in ameliorating and healing ulcerative conditions in esthiomene though naturally it cannot resolve the pathology in such conditions.

Soft Sore. Bubœs have always been incised and not aspirated. Healing under sulfa is much quicker after incision.

Senior Medical Officer, Social Hygiene Division Dr. L. M. Ram, M.B., B.S., M.R.C.P. (Edin.), D.P.H. (Lond.).

DEPARTMENT OF SOCIAL HYGIENE, SINGAPORE

TABLE SHOWING TYPE OF VENEREAL DISEASE, MALE AND FEMALE PATIENTS, TREATED AT THE MIDDLE ROAD HOSPITAL AND TANJONG PAGAR CLINIC DURING 1950

	IN-PATIENTS			OUT-PATIENTS				OUT-PATIENTS				OUT-PATIENTS			
	Males	Females	Total	NEW CASES				REPETITIONS				TOTAL ATTENDANCES			
				Tr. D and M.R.H. Males	Tr. D and M.R.H. Females	T.P.C. Males	Total	Tr. D and M.R.H. Males	Tr. D and M.R.H. Females	T.P.C. Males	Total	Tr. D and M.R.H. Males	Tr. D and M.R.H. Females	T.P.C. Males	Total
SYPHILIS:—															
Primary	16	20	36	318	12	155	485	3,122	722	4,453	8,297	3,440	734	4,608	8,782
Secondary	59	63	122	325	55	80	460	18,552	2,523	5,293	26,368	18,877	2,578	5,373	26,828
Tertiary	122	118	240	277	50	51	378	4,770	1,918	362	7,050	5,047	1,968	413	7,428
Congenital	15	187	202	33	136	2	171	393	2,900	46	3,339	426	3,036	48	3,510
Period not indicated	69	777	846	493	433	92	1,018	5,596	15,056	1,031	21,683	6,089	15,489	1,123	22,701
OTHER VENEREAL DISEASES:—															
Gonorrhœa	15	208	223	1,719	283	814	2,816	5,938	696	5,113	11,747	7,657	979	5,927	14,563
Gonorrhœa Ophthalmia	..	48	48	1	48	..	49	..	32	..	32	1	80	..	81
Gonorrhœa Complications	..	14	38	54	14	22	90	890	41	407	1,338	944	55	429	1,428
Soft Chancre	30	10	40	1,077	16	507	1,600	5,681	121	4,006	9,808	6,758	137	4,513	11,408
Lymphogranuloma	38	4	42	145	3	85	233	750	94	533	1,377	895	97	618	1,610
Mixed Infections	10	45	55	282	34	171	487	748	1,038	1,124	2,910	1,030	1,072	1,295	3,397
NON-VENEREAL DISEASES	145	596	741	3,418	3,710	1,043	8,171	6,925	6,344	1,654	14,923	10,343	10,054	2,697	23,094
Total	543	2,090	2,633	8,142	4,794	3,022	15,958	53,365	31,485	24,022	108,872	61,507	36,279	27,044	124,830

COLONY OF SINGAPORE

OUT-PATIENTS

NEW CASES

				Males	Females	Total
Chinese	...	...	...	6,370	3,440	9,810
Indian	...	...	...	3,190	431	3,621
Malaysian	...	...	...	996	850	1,846
Eurasian	...	...	...	76	20	96
European	...	...	...	405	—	405
Others	...	...	...	127	53	180
Total ...				11,164	4,794	15,958

OUT-PATIENTS

REPETITIONS

				Males	Females	Total
Chinese	...	...	...	45,530	21,167	66,697
Indian	...	...	...	23,414	3,101	26,515
Malaysian	...	...	...	5,889	6,247	12,136
Eurasian	...	...	...	808	449	1,257
European	...	...	...	1,123	—	1,123
Others	...	...	...	623	521	1,144
Total ...				77,387	31,485	108,872

CHAPTER TWENTY-TWO

MATERNITY AND GYNÆCOLOGY

KANDANG KERBAU HOSPITAL

KANDANG KERBAU HOSPITAL continued as the main centre for all Government maternity and gynæcological work in the Colony. Although the bed strength remained at the same basic level, that is, some 240 beds excluding cots, the hospital admitted 20,474 cases during the year. This is nearly 4,000 more than the previous year and more than double the 1947 admissions. The number of hospital births averaged well over 1,000 per month and again produced an all-time record. To ease the overcrowding the length of stay of each patient in uncomplicated cases was curtailed to three days.

During 1951 maternity admissions totalled 17,906 with 13,582 deliveries, as against 14,197 admissions in 1950 and only some 8,000 in 1947.

The percentage of maternal deaths to total deliveries has shown a steady reduction over the post-war years, as is seen from the following figures, in spite of the adverse conditions from overcrowding and shortage of trained staff:—

1947	...	...	0.92 per cent
1948	...	...	0.62 per cent
1949	...	...	0.51 per cent
1950	...	...	0.46 per cent
1951	...	...	0.23 per cent

This is a very satisfactory position when it is noted that all abnormal and difficult cases find their way to this hospital from a population of over one million and that many women only arrive when labour is far advanced, or even after labour.

Abnormal deliveries dealt with increased considerably over any previous year. 3,027 such cases came into hospital in 1951 compared with 1,541 in 1947. Of these 3.7 per cent died.

Cases numbering 2,568 were admitted to the gynæcological wards as compared with 2,494 in 1950. 3,133 cases were operated upon (872 of these being treated as out-patients), some returning to their homes the same day.

There has been an interesting increase in the number of Cæsarean operations over the post-war period—165 such operations in 1951 with only 20 to 30 in 1947 and previous years, about half of which were for placenta prævia; 122 cases were delivered with forceps; 436 breech presentations were seen: still births numbered 358.

Premature births numbered 1,094 (with 175 deaths) and are so called if the new born infant weighs less than 4½ lbs. On this assessment the figures of previous years in this respect have been under-estimated. The real increase in the number of premature babies dealt with, however, is some reflection on the increased effort which is being made to admit as many mothers as possible below par. While it is quite impossible under the existing conditions in this hospital to create a special nursery for these infants they do receive a good deal of added care and attention. Fortunately prematurity is not the serious problem in this country that it is in more temperate climes. The new hospital and the improvements to the existing institution proposed under the Medical Plan envisage particularly up to date accommodation for this purpose.

Kandang Kerbau Hospital is a free institution except for a small paying block where patients can be dealt with by their own practitioners. This system is a necessity in Singapore where private maternity homes cover only

a negligible number of beds. With the facilities provided by this hospital, by the rural Government maternity service, and by the City Council maternity service, over half the total births in the Colony are now controlled. The hospital dealt with 28 per cent of the total births. The rural service covered over 66 per cent of the births in the rural districts.

The following conclusions can be drawn from present experience:—

(a) the disappearance of any fear of hospitalisation by the women of the Colony and a steadily increasing demand for both in-patient and out-patient treatment. In 1919 only 232 patients sought maternity care: 1,606 in 1929: 6,034 in 1939, 12,678 in 1949 and 17,906 in 1951. An institution designed for 200 in-patients on a ten-day stay and a small ante-natal division only, and staff quarters accordingly, can only reach the present record figures with a serious danger of exhaustion and loss of efficiency. The present aim is still to admit all who seek admission however, on the assumption that some aid is better than none;

(b) the rapidly increasing desire for ante and post-natal supervision—a most satisfactory feature—which must be met by increased facilities at the earliest possible moment. It is no use having health propaganda without the means to meet it. This is leading to—

- (1) the continued reduction in the maternal mortality figure;
- (2) the increase in the number of abnormal cases seeking early admission; the increase in the number requiring Cæsarean operation;
- (3) the disappearance of destructive operations on the child (decapitation, etc.);
- (4) the low forceps delivery figure;
- (5) the reduction in eclampsia;
- (6) the reduction in transverse presentations;
- (7) the increase in the numbers of premature infants seen.

*Footnote:—*Professor English who was for many years Professor of Midwifery and Gynæcology in Singapore has recorded the following hospital deliveries over the years:—

1915 ...	175	1932 ...	2,146
1916 ...	195	1933 ...	2,306
1917 ...	206	1934 ...	2,575
1918 ...	221	1935 ...	3,548
1919 ...	232	1936 ...	4,707
1920 ...	342	1937 ...	5,214
1921 ...	496	1938 ...	5,551
1922 ...	466	1939 ...	6,034
1923 ...	797	1940 ...	6,184
1924 ...	688 (moved in new site)	1941 ...	6,425 (only 300 in December)
1925 ...	588	1942 ...	1,913
1926 ...	753	1943 ...	2,037
1927 ...	1,019	1944 ...	1,657
1928 ...	1,304	1945 ...	1,584
1929 ...	1,606	1946 ...	5,101
1930 ...	1,882	1947 ...	7,802
1931 ...	1,955		

Since then the statistics read as follows:—

1948 ...	10,272	1950 ...	13,238
1949 ...	10,928	1951 ...	13,582

OUT-PATIENT CLINICS

In addition to ante-natal, post-natal and gynæcological clinics, there is a clinic for women and children where medical assistance and advice on general ills may be obtained. All these clinics again dealt with a considerably increased number of patients and are becoming widely appreciated amongst the indigent population. Some 9,600 examinations of babies were carried out in the post-natal clinic. The following table gives some indication of the present out-patient provision at this hospital.

Clinic	1947		1949		1951	
	New Cases	Total Attendances	New Cases	Total Attendances	New Cases	Total Attendances
Ante-natal and Gynæ-cological ..	7,033	24,683	12,665	37,010	15,886	40,746
Post-natal:—						
Mothers ..	..	} 19,930	..	6,931	8,096	10,184
Infants ..	..		..		7,733	9,658
Women and Children ..	..	31,908	16,333	49,139	16,282	55,320
Total ..	7,033	76,521	28,998	93,080	47,997	115,908

Routine laboratory examinations numbered 33,439 as against 29,346 the previous year.

The Medical Plan seeks to more than double the facilities available both in the Maternity and the Gynæcological sections, to entirely modernise the sections existing, and to establish a really up to date series of out-patient divisions covering the various aspects of ante and post-natal activities now being attempted. The above figures in the present very limited and outmoded accommodation surely stress the urgent need for these steps without further elaboration. The sooner they are implemented in part or in whole the better for the future health of the community. For such an area as Singapore with a high proportion of the population living in inferior accommodation, it is extremely difficult for a district urban maternity service to function really efficiently. In consequence the Maternity Hospital must of necessity take an ever increasing proportion of the 'labour' developing. That so much is being done with so little in this respect in Singapore today is one of the 'miracles' of our post-war period. It must not be forgotten, however, that institutions for the sick which are so seriously and chronically overcrowded as this are subject to the constant risk of some form of institutional disaster.

By the end of the year plans had been completed to extend the existing institution into a 350 bedded unit with the necessary out-patient divisions on the most up to date lines. Later on a further 240 beds will be provided on another site.

The hospital was re-organised on a two-unit system during the year and this will increase the efficiency of the present organisation. A third unit will be added when the above plans come into operation.

The important Central Midwives Board continued its periodic meetings. In particular it dealt with the difficult problem of modernising the training of midwives and of exercising sufficient control over the work of the midwives in practice already. An up to date revised Midwives Ordinance introducing and covering a new scheme of training based on that in the United Kingdom was under review. The difficulty so far has been to include provision for a continuance of the lower standard Malay girl so necessary to the rural areas. The World Health Organisation is helping in the provision of more expert training staff.

A new Ordinance for the Registration of Nursing Homes and Maternity Homes was also drafted.

As highly qualified midwives must take more and more of the work previously undertaken by nurses, the new training and all to do with it have a most important bearing on the immediate future.

The Hospital continued to be a part of the Medical School, and students received their maternity and gynæcological practical training here as in previous years. Nurses and midwives continued to receive lectures and practical demonstrations for the certificates of the Central Midwives Board. 35 medical students attended the hospital during the year while 20 nurses and 53 midwives sat for their respective examinations.

Medical Superintendent: Dr. W. A. Balhetchet, O.B.E., L.M.S. (Singapore).

Professor of Gynæcology and Obstetrics: Professor B. H. Sheares, M.D., University of Malaya: L.M.S., Singapore, M.R.C.O.G. (London).

Gynæcologists and Obstetricians: Dr. A. C. Sinha, L.M.S. (Singapore) M.R.C.O.G. (London): Dr. (Miss) E. V. Crowe, M.B., CH.B., F.R.C.S.E.

CHAPTER TWENTY-THREE

LEPROSY

TRAFALGAR HOME SETTLEMENT

ALTHOUGH progress was made during the year on the second stage of the three-stage scheme to bring the accommodation and treatment of leper patients into line with the latest ideas on the subject, the increasing number of patients admitted filled the old camp and the new semi-detached quarters of the first stage to overflowing again by the end of 1951. Thus it is clear that a serious crisis in this direction has just been avoided: that the completion of this part of the Medical Plan is very urgently needed.

The total bed strength on 31st December, 1951 was 646 an increase of 195 over the last two years in spite of 355 still being housed in the Federation of Malaya.

				<i>Male</i>	<i>Female</i>	<i>Total</i>
Adults	...	...	...	384	173	557
Children	...	...	...	54	35	89
				<hr/> 438	<hr/> 208	<hr/> 646

DEVELOPMENT OF THE TRAFALGAR HOME UNDER THE MEDICAL PLAN

Work on the first part of the second stage of the development plans, namely the building of 41 blocks of semi-detached houses, was started in October 1951 and is expected to be completed in April of 1952. The houses are being constructed and furnished on the same pattern as the 28 of the first stage except that the kitchens have been slightly modified. These 41 blocks will accommodate 164 patients. The buildings of the second stage will be occupied by male patients and one portion of the first stage will then be occupied by about 80 women. The transfer of 80 female patients from the present walled female camp will reduce the present overcrowding considerably and produce a more reasonable standard of accommodation there.

A water tank holding about 38,000 gallons has been built to meet the requirements of the new buildings, but further improvements in the supply are still necessary.

The rest of the second stage consists of the provision of two dormitories, an out-patient division and staff quarters. Its completion cannot be long delayed. A community hall and school have been promised by Rotary and a chapel by the Roman Catholic community. These welcome additions will make their appearance next year.

TREATMENT

The following is a resumé of the treatment carried out:—

Total number of patients ...	...	...	...	646
Total number of patients on Sulphone Injection	...	...	...	394
Total number of patients on Sulphetrone Injection	...	...	...	172
Total number of patients on Sulphetrone Tablets	...	...	...	30
Total number of patients on Diasone Tablets	...	...	...	—
Total number of patients on Thiacetazone Tablets	...	...	...	19
Total number of patients on specific treatment	...	...	...	29
Total number of patients Hydnocarpus Injection	...	...	...	2

COMPARATIVE TABLE OF CASES DISCHARGED AS NON-INFECTIOUS

Year			Male	Female	Total
1948	...	...	2	—	2
1949	...	...	16	10	26
1950	...	...	37	17	54
1951	...	...	43	17	60

TREATMENT FOR LEPROSY OUT-PATIENTS

Sulphone in Oil	... 394	Number admitted	... 224
Sulphetrone Tablets	... 30	Number discharged	... 60
Sulphetrone in water	... 172	Number died	... 13
Diasone Tablets	... —	Number transferred	... 1
Hydnocarpus Injection	... 2	Relapses readmitted	... 2
Thiacetazone Tablets	... 19		

Sulphone in oil has been used as the standard treatment and has been tolerated well by the majority of the patients. Sulphetrone in water injection and sulphetrone tablets have been used in a number of cases. Early in the year, Messrs. Boots Pure Drug Co. (Far East) Ltd., made a quantity of thiacetazone available for use in leprosy, and a number of patients were tried on this drug. The good results suggested in glowing terms by Tyrie in August 1950 could not be reported here though the drug was found to be active in roughly the same rate as in sulphone in oil. In the early case it appeared to have no great advantage over sulphone, but in the more advanced cases it infrequently produced evidence of liver damage as manifested by the appearance of an excessive amount of urobilinogen in the urine. However a number of cases in which the sulphone could not be used without provoking severe lepra reaction were found to be able to tolerate thiacetazone.

Due to the smallness of the staff and difficulty in controlling adequately the widespread use of thiacetazone, work on combined treatment with sulphone and thiacetazone was not attempted, though it is quite possible that this may be of real value.

The number of cases discharged from the Home rose in 1951 to 60 as compared with 54 in 1950. Sulphone appears to have a very real and valuable effect in nearly all cases of leprosy, and there has been a steady decrease in the number of bacilli present on smears in practically all cases under sustained treatment.

Lepra reaction continues to be an imposing problem in treatment. Antimony-salts, antihistamines, calcium injections, etc., etc., have all been tried with varying success, but some cases still react unremittingly. It is proposed to try some of these cases on A.C.T.H. in the new year. Cases have to be admitted to hospital for these experiments.

Leprosy as a disease problem seems to vary in different parts of the world. It may well be that it reacts less favourably to the new drugs in such cases as the Chinese and that less than 50 per cent of cures can be expected in such an area as Singapore. In any case some five years are required to get results even today and relapses may occur even then.

The diet of the patients again received close attention in view of the very important part it plays in the treatment of such a chronic disease. Unfortunately the present kitchens are antiquated and inadequate. Neither are proper dining and storage rooms available. The Medical Plan will remove these disadvantages, of course, but progress takes time.

As from February 1950, weekly out-patient divisions operated at the Tan Tock Seng and General Hospitals where patients discharged as cured continued observation and treatment. In August 1951, however, the General Hospital was closed to such cases with a concentration at Tan Tock Seng.

Early non-infectious cases discovered by the School Health Department are still observed and treated by the School Health clinics and thus avoid the danger of social stigma which can be so damaging to their future. Treatment is mostly carried out with weekly injections of diaminodiphenyl sulphone suspension in coconut oil which has been found to be the most practical way of ensuring that adequate dosage is given with the minimal risk of complications.

Regular attention is ensured through close co-operation with the City Council and Rural Health Departments, and if a patient fails to attend regularly the Health Authority is informed and the patient is visited and instructed to attend. If this fails he may be required to re-enter the institution. So far only 11 of the 300 out-patients of the Department have failed to attend regularly. This rate of absence is surprisingly low and is a tribute to the value the patients place in modern treatment.

Rehabilitation of discharged lepers is the problem which requires early solution. Inmates who have been discharged find it very difficult to settle down to a non-institutional life after so many years, or to get employment if they bear any obvious stigmata of the disease. Various degrees of disability resulting from the disease alone make it difficult for the unfortunates concerned to carry out their original type of work. Here is where a physiotherapist comes into the picture as in so many other sections of our work today.

OCCUPATIONAL AND DIVERSIONAL THERAPY

In 1950 the Home had the part-time services of an occupational therapist from the General Hospital until she left the Colony in November. In consequence in August 1951 Mrs. Thomson, the present Chairman of the Hospital Diversional Therapy Unit which has its headquarters in the Tan Tock Seng Hospital visited the camp and prepared plans for work on somewhat similar lines to those in use for her tuberculosis patients. It is hoped that this effort will be still further extended in 1952, and that more workers can be persuaded to come and give their time to this important therapy scheme. The value of the work done by these ladies both in Tan Tock Seng Hospital and in Trafalgar Home cannot be over estimated.

VOCATIONAL TRAINING

A small amount of vocational training is being done for adolescent boys in the Home. 17 apprentices are now learning carpentry, brick laying, plumbing, minor electrical repairs, furniture making, etc. They receive a small amount of pocket money and some of them are making good progress. Their training will be of assistance to them in obtaining employment on their discharge. This is an aspect of our work which deserves considerably more attention, as the discharge rate of patients undergoing treatment has risen steadily since the introduction of the sulphone drugs.

SCOUTING AND GUIDING

The Scout and Guide movements which were introduced to the Camp some three years ago have continued to flourish and are enthusiastically supported by the boys and girls. A 'Guide' Company of 36 girls under the care of Miss Eastaugh, the Almoner, General Hospital, and Mrs. Langley has weekly meetings in the school grounds. The traditional songs and games and practical work, and the principles of the Guide Movement are taught and applied. Picnics and outings are arranged about once a month to one of the smaller islands and the girls are enthusiastic in their support.

The Green Cross Scout Troop in which there are 35 boys is run by Mr. Stephen, the Hospital Assistant, with the assistance of one of the Service Rover Scout Units at the R.A.F., Seletar. Regular weekly meetings are held and while some of the scouts are perhaps unduly handicapped, most are able to join in the ordinary pastime duties and games and instructions associated with this excellent movement. The grateful thanks of the administration are extended to these volunteer workers.

SCHOOLS

Since the retirement of Miss M. A. Buxton, M.B.E., from the school in 1950, the onus of teaching devolved almost entirely on the inmate teaching staff, none of whom had previous experience apart from work in the Settlement. Later Mr. G. D. Champion took over the senior classes, including the nurses, dressers and teachers, three times a week to improve the general standard of education. The smaller children continued in the care of the inmate staff with occasional visits from the Supervisor of Primary Schools who has organised the supply of books and has given advice on the general running of the school.

It soon became clear that the school could not look to the Education Department for a permanent qualified teacher owing to its own policy of considerable expansion. In addition, no teacher showed any inclination to take up this kind of work which requires a special vocational outlook. Accordingly, following a discussion at the Leper Welfare Committee, two Christian Missions were approached. The Church of England offered Mr. G. D. Champion, who had previously done part-time work in the Home, as a full-time teacher, and he came on a full-time capacity on 1st November. Then a teacher in one of the Government Schools had the misfortune to contract leprosy and had to enter the Home. So he will continue to work until fit to return to his outside occupation. Thus by the close of the year the schools were in better shape than ever before. The promise of a new school building-cum-community hall has now been made by the Rotary Club of Singapore as its new appeal for 1952.

The education of the younger patients must assume a most important place in a Home of this type, as modern treatment is bringing early cases a hope of arrest sufficient to allow of discharge in due course. Consequently it is important that such a child's education should not be seriously interrupted. There were 101 students in the school in 1951, and as six were due for discharge in December, the school will start the new year with some 95 students.

TRAFALGAR HOME WELFARE COMMITTEE

During the year the Welfare Committee continued its 'pocket money' scheme for children in the Home and in the summer an effort was made to improve the schools by obtaining trained teachers as noted above.

The constitution of the Committee was also discussed and steps were taken to reform it. A form of registered association for the welfare of leprosy patients in the Colony is the aim, and plans for launching such an organisation are being finalised.

Christmas 1951 was without doubt the most successful so far. An excellent party for all inmates was organised by the Welfare Committee and gifts were presented to each patient. Further, on the 22nd of December, the children were given a special party organised by the Sisters of the Franciscan Missionaire which was greatly enjoyed.

INMATE STAFF

The strength of the inmate staff was increased to 162 as compared with 132 in 1950. This has been necessary to keep up with the expansion and development of the Home. All routine camp duties are performed by the inmates under the supervision of the two inmate supervisors who are responsible to the resident Hospital Assistant-in-Charge. The standard of work done by many of the inmates is comparable with that appertaining to institutions outside the Home. In December the Hospitals Board approved a higher salary scheme which brings the rates of remuneration into line with those of the Sungei Buloh Settlement in the Federation of Malaya.

There are 13 inmate dressers and 10 inmate nurses employed in the hospital wards under the supervision of the Nursing Nuns and the Hospital Assistants. The standard of nursing has gradually improved. Some of the inmate nursing staff who have been working in the wards since the present scheme started in 1947, have now been promoted to a higher salary grade in recognition of their improved standard of work and ability to undertake responsibility.

A large part of the land surrounding the settlement is farmed by the inmates. This gives many of them the occupation which is so essential in such a community. Pigs and poultry are reared and a variety of vegetables and flowers are grown. Individual farmers sell their produce to inmate contractors who in turn deal with Government at contract rates for feeding the inmates of the Settlement itself and the Mental Hospital.

The gates of the settlement are now left permanently open and every effort is made to dispel the feeling of internment or imprisonment. All the glass and barbed wire which was placed on top of the surrounding walls has been removed and the walls painted in attractive colours. Creepers are being placed inside the walls to increase the garden effect.

The outside staff of the Home consists of a part-time medical superintendent, a part-time resident medical officer, two hospital assistants, two mission nursing sisters, one clerk, two hospital servants, three watchmen and one van driver.

Dr. A. L. Greenway, M.B.E., M.R.C.S., L.R.C.P., was Medical Superintendent till June when the administration was taken over by Dr. R. J. Grove-White, M.D. (Dub.), M.R.C.P. (Ed.), who also supervised the medical treatment. Dr. R. S. Corbitt, M.B., B.S. (Madras), was Resident Medical Officer.

CHAPTER TWENTY-FOUR

OTHER SPECIAL DEPARTMENTS

DIVISION OF RADIOLOGY

DURING the year a total of 52,199 radiographic examinations were made in the X-ray departments of the General and Tan Tock Seng Hospitals compared with 45,738 in 1950. These figures do not take into account cases examined simply by fluoroscopy at Tan Tock Seng to assess progress of collapse therapy (5,432). The progressive increase in the annual volume of radiographic work since the war has thus been maintained as can be seen by the following figures:—

1938	...	...	...	...	6,000
1947	...	...	...	...	17,562
1948	...	...	...	...	21,562
1949	...	...	...	...	30,069
1950	...	...	...	...	45,738
1951	...	...	...	...	52,199

With the opening of new X-ray departments in Kandang Kerbau Hospital and Woodbridge Mental Hospital, a considerable further increase can be expected by the end of 1953.

The figure of 27,791 for the General Hospital is slightly lower than in 1951 (29,200). This is due to the fact that all routine chest examinations and survey work are now carried out in Tan Tock Seng Hospital where 24,408 examinations were made, an increase of 7,890 over the 1950 figure of 16,518. In spite of the fall in the total numbers, more cases of a general nature were examined in the General Hospital than ever before, and a stage has been reached when any further increase in the volume of work undertaken can be achieved only by an increase in staff and accommodation to meet the apparatus on order.

The work at Tan Tock Seng Hospital is practically entirely chest work and there were only 110 other types of examination performed there. 'broken down' figures showing the variety of examinations undertaken in the X-ray departments in Singapore are given in the appendices to this section.

STRUCTURAL ALTERATIONS, ETC. TO X-RAY DEPARTMENT IN 1951

The entrance to the X-ray department was altered and the office rearranged. The dark room was enlarged and air-conditioned, new wet and dry benches provided, and 'through-the-wall' film pass boxes were constructed. A wet film viewing room was established. A small room was furnished to provide a changing room suitable for female patients, and small cubicles were constructed in which men patients can change before examinations. The department was completely redecorated.

Funds have been asked for to build a film drying room and to provide a toilet for patients adjoining the diagnostic rooms, while alterations have been planned to provide additional space for new X-ray equipment and separate offices for radiologists and radiotherapists.

In Tan Tock Seng Hospital a separate screening room was constructed in the clinic to accommodate a small unit specially designed for mass screening.

EQUIPMENT

The diagnostic work in the X-ray department, General Hospital, has been carried out on one Newton Victor 400 M. A. unit, two Watson Mobilex 50 M.A. units and 3 MX2 portable units.

Spares and replacements for the renovation and modernisation of the old pre-war duo-valve unit arrived in October, and although work on it has been intermittently held up for various reasons, the unit should be fully functioning early in 1952.

A refrigerating developing unit was installed in August and this has improved the standard of development of films to a marked extent. An air-conditioner was installed in the dark room in October and this improved working conditions a great deal.

A small mass screening unit was purchased for Tan Tock Seng Hospital for the use of physicians wishing to check their own cases on collapse therapy.

STAFF

Radiologists. Dr. Winchester's retirement in September left only two qualified radiologists in Government Service in Singapore. A young doctor was posted to the X-ray department in June as a trainee and it is hoped to send him to England in due course to train and qualify as a radiologist. As it is quite impossible for one radiologist alone to undertake all the X-ray work in Singapore the present position may well become difficult.

Radiographers. Mrs. Simons (M.S.R.) has been in charge of radiography throughout the year and has worked hard and conscientiously to improve the standards of technique. Her efforts have met with success. For the greater part of the year the radiographic staff was five—Mrs. Simons, three hospital assistants and one X-ray technician. Another lady radiographer recently arrived from England, but unfortunately Mrs. Simons is shortly returning there so that no gain in trained personnel can be expected for the present.

In September one hospital assistant was sent to England on a scholarship for a two-year course in radiography to take the M.S.R. examinations, and another has been awarded a scholarship for 1952.

Developers. There has been some difficulty in recruiting developers of suitable intelligence from the ranks of ordinary hospital attendants, for the work is arduous and the hours long.

RADIOTHERAPY SECTION

STAFF

Dr. F. Y. Khoo took over this section in June 1951. As the only M.S.R. qualified radiotherapist in Singapore left early in 1951 the operation of the deep X-ray units in the therapy section has been carried out by a Sister with no special radiotherapy qualifications. She has managed well but the position is unsatisfactory for she is not qualified to shoulder the responsibility of administering radiation that can cause injury to patients if improperly delivered. Consequently far more time has to be spent in supervision than should be necessary. A staff nurse was posted to the radiotherapy department at the end of the year to learn how to operate the equipment and to assist the Sister. Action is proceeding to recruit further experienced diagnostic radiographers.

EQUIPMENT

The 140 K.V. intermediate therapy unit started at long last to function in August. Until then the only therapy unit working was the Maximar 400 K.V. deep therapy unit. A 200—250 K.V. therapy unit and a superficial therapy unit are required to equip the department completely for all types of work. This is under action.

WORK DONE

A total of 214 cases were treated in the Radiotherapy Section during 1951 as against 126 in 1950. 142 of these were cases of malignant disease (cancer), the largest single group being the post-nasal growths so common in this part of the world and almost entirely confined to the Chinese race. Detailed figures of the work covered is given in Appendix C.

TEACHING

During the Michaelmas and Lent terms a course of twenty lectures in Radiology was given to the 4th year medical and dental students in the University of Malaya. Sixty attended, the largest class up to date. Demonstrations of technique were given in the X-ray department, and students were encouraged to attend screening and reporting sessions throughout the year.

NEW TECHNIQUES

During 1951 certain new techniques in radio-diagnosis were employed for the first time. In January the first cardio-angiography was performed on a patient, and films were obtained of the chambers of the heart and great vessels opacified by a medium injected intravenously. Later in the year cerebral angiography was performed for the first time, demonstrating in detail the blood vessels of the brain. Since then several cases have been examined by these methods. For these purposes a home-made rapid cassette changer is used and although on the whole reasonable results have been obtained, it is not completely reliable and specially designed equipment must be purchased if more frequent examinations of this type are to be performed. In radiotherapy, nitrogen mustard (NH₂)—a substance closely allied to mustard gas—was used in the treatment of cancer for the first time in Malaya early in 1951, and since then a number of cases have been treated with it. It has proved to have a beneficial effect in cases of nasopharyngeal carcinoma, especially in the more rapidly growing types and in certain diseases of the reticulo-endothelial system such as Hodgkin's disease. It is usually used together with radiotherapy, and the combined treatment appears to be more effective than radiation alone, but further work must be done on this subject before a definite and factual report can be made.

LOOKING AHEAD

The purchase of new high-powered diagnostic equipment has been approved, and this will considerably improve the efficiency and scope of the department.

Two mobile units have also been ordered, and arrangements have been made with the Professor of Surgery to use one of the rooms in the 'A' theatre block adjoining the X-ray department as a genitourinary diagnostic room. This will relieve a great deal of congestion, for these cases usually tie down the larger units for long periods of time.

It is also proposed to open a small X-ray department in the new Orthopaedic Centre, and another in the new Out-patient Department. These by

filtering off a number of routine orthopædic and fracture cases should relieve some of the strain thrown on the main X-ray department, and at the same time save these patients and other out-patients a long wait in the X-ray section when there are a lot of cases for examination.

By the end of 1952 the X-ray department in Kandang Kerbau Hospital should be functioning, and a smaller department in the Woodbridge Mental Hospital should be in operation. This decentralisation will still further relieve the strain on the main X-ray department, and by dispersal will be of obvious advantage in civil defence should the necessity ever arise.

It is proposed to adopt a new system of records and filing because of the increased volume of work. In this connection a new system of request forms and of filing of records has been devised, and permission has been sought to micro-film records of all films taken in the department. As it is possible by this method to store in 10 cubic feet records which at present require 1,500 cubic feet the saving in space will be considerable. At the same time it will enable records of cases to be kept for many years instead of discarding films only three years after they are taken owing to deterioration and lack of space.

Both Dr. Winchester and Dr. Young have stressed the fact that the new equipment is now forthcoming to create a first class X-ray division in Singapore but that this cannot be put to proper use *until more space is available*. This depends on the advance of the Medical Plan particularly at the General Hospital. Dr. Young concludes as follows:—

Singapore lies at one of the cross-roads of the world. Numerous eminent and influential men and women—both medical and non-medical—pass through the Colony and visit the hospitals here, the traffic through Singapore probably being as great as in any other area in the British Commonwealth. Their impression of British Colonial rule must obviously be largely influenced by what they see for themselves and by what they hear. Singapore is one of the show windows by which they are guided, and the X-ray department is one of the first places they see if they visit the hospital. At present it is cramped, overcrowded and overworked; but given more staff and accommodation to operate and accommodate the first class equipment that will shortly be arriving it can be made the finest X-ray department in the East and something of which Singapore may well and justly be proud. This was Dr. Winchester's vision and it is incorporated in the Medical Plan. Every effort must be made to accord it the priority it deserves.

APPENDIX A

FIGURES OF CHIEF EXAMINATIONS PERFORMED DURING 1951 IN DIAGNOSTIC SECTION, SINGAPORE

GENERAL HOSPITAL

Chest	...	...	...	...	14,656
Bronchography	...	...	...	...	93
Gastro-intestinal Tract (Barium Meals and Enemas)	...	...	...	...	1,171
Renal Tract	...	...	...	...	677
Gall Bladder	...	...	...	...	226
Heart	...	...	...	...	305
Pregnancy including Pelvimetry	...	...	...	...	473
Salpingography	...	...	...	...	9
Encephalograms	...	...	...	...	55
Bone and Joints (a) Injury	...	...	...	...	4,931
(b) Pathology	...	...	...	...	4,186
Sinuses	...	...	...	...	656
Teeth	...	...	...	...	27
Others	...	...	...	...	326
Total					27,791
Average per month					2,316

APPENDIX B

TAN TOCK SENG HOSPITAL

Large film chest	...	18,327	Government Servants	...	2,356
Miniature film chest	...	5,971	School Children	...	2,290
			Contacts (T.B.)	...	598
			Miscellaneous	...	727
Other Examinations	...	110	Bronchoscopy,		
			Barium Meal, etc.,		
			Heart,		
			Pelvimetry,		
			Salpingography.		
Total	...	24,408			
Average per month	...	2,034			

Fluoroscopic Screen Examination only for check or collapse therapy, etc.

X-ray Department	...	...	...	1,232
T.B. Clinic	...	...	...	4,200
Total	...	...	...	5,432
Average per month	...	...	...	452

APPENDIX C

DEEP X-RAY THERAPY

Malignant Disease

Post nasal Carcinoma (Lympho-epithelioma, Squamous Epithelioma, transitional cell growths, etc.)	...	...	...	39
Head and Neck: Scalp-Parotid-thyroid Pituitary, Antrum and Larynx	...	...	...	15
Oral Carcinoma (Tonsil-Cheek-tongue, etc.)	...	...	...	14
Breast	...	...	...	9
Uterus	...	...	...	5
Lymphoblastomas: Hodgkin's disease, Leukaemia, etc.	...	...	...	12
Skin and Soft tissues	...	...	...	18
Sarcoma of bone	...	...	...	2
Miscellaneous	...	...	...	6
				120

BENIGN CONDITIONS

Osteoclastoma	...	...	...	2
Ankylosing Spondylitis	...	...	...	9
Haemangiomas	...	...	...	7
				18

SUPERFICIAL THERAPY

Rodent ulcers	...	...	...	10
Keloids	...	...	...	16
Haemangiomas	...	...	...	7
Warts	...	...	...	9
Skin diseases—Eczema Acne, etc.	...	...	...	18
Hyperthyroidism	...	...	...	4
				64

RADIUM	...	...	...	...	12
Total	...	...	...	...	214

Twelve patients were treated with radium—either in the form of interstitial implants or as surface radiation using moulds.

Dr. J. W. Winchester, M.D., D.M.R.E., was in charge of the Radiology Division until he retired, in September, when Dr. W. B. Young, M.B.E., B.M., B.CH., M.R.C.S., L.R.C.P., D.T.M., D.M.R., took charge, Dr. Khoo Fun Yong, M.B., B.S. (Hong Kong), F.A.C.R. was the Chief Assistant throughout the year.

PHYSIOTHERAPY

The three separate physiotherapy sections continued to function on an ever increasing scale during the year—medical physiotherapy, surgical physiotherapy and occupational therapy.

(a) The medical physiotherapy unit is confined to the General Hospital and provides such treatment as short-wave diathermy, infra-red, galvanism and faradism. During the year a new radio-diathermy unit was added. The total number of cases has increased considerably over the post-war decade and the record of 19,833 was achieved in 1951. These necessitated 30,083 treatments. One qualified physiotherapy sister ran the division with two assistants. This section was started by the radiological division and has continued under this control so far. It will eventually become a part of the new Orthopædic Unit to be evolved in 1952 as more and more surgical cases are being referred to it.

(b) The very important surgical physiotherapy unit only commenced operations in 1948. It has now been built up to five physiotherapists who cover the whole hospital organisation dealing with many cases necessitating prolonged and complicated treatment to prevent permanent crippling. The work covered has been more than doubled over the past two years and comprised the following treatments during 1951:—

Ward cases at the General Hospital	...	...	38,609
Poliomyelitis	...	...	12,323
Out-patients at the General Hospital	...	...	8,750
Ward cases at Tan Tock Seng Tuberculosis Hospital	...	...	1,611
Ward cases at St. Andrews Children's Hospital	...	...	272
Total			61,565

During the year particular attention was paid to post-polio cases. These have to be retained in hospital for prolonged periods under expert attention as experience has shown that the majority become helpless cripples if returned to the care of relatives, many of whom appear to evade and misinterpret the most detailed instructions and careful follow-up. In consequence some thirty-five cases are retained at Middleton Infectious Disease Hospital in a separate ward while others are kept at the General and Orthopædic hospitals. As Acute Anterior Poliomyelitis is now an endemic disease with periodic manifestations the number of cases to be dealt with by prolonged hospitalisation and treatment under this head alone is steadily mounting and means a special institution for the purpose. This is a problem which is receiving the attention of the Social Welfare Council as a priority in consequence.

There are many other surgical conditions which need the prolonged and expert care of the physiotherapist if Singapore is to be saved from a serious 'cripple after-care' problem. The money spent in this direction in the early stages of many serious conditions is money saved. So this very essential work must be continually and steadily expanded not only in the cause of humanity and human suffering, but in the cause of common sense.

One of the more important recent developments has been the increase in the amount of thoracic work, and in the post-operative care which must be given by the physiotherapist.

The fracture follow-up clinics at the General Hospital have become an established procedure. A physical training class for selected patients is also a feature of this section of the hospital's work.

(c) Occupational therapy work at the General Hospital suffered a relapse during the year in that the only qualified and experienced officer employed resigned towards the end of 1950 and it was not until the end of 1951 that two newcomers were available. Nevertheless, the work continued at the Mental Hospital and at Tan Tock Seng and the Children's Orthopaedic Hospitals under the ladies voluntary diversional therapy unit. This is a procedure which is essential to the treatment and well-being of all patients suffering from prolonged hospitalisation. Thus it is a necessary part of any mental or tuberculosis institution: such patients often cannot be cured without its aid. Many patients in a general hospital also require this guidance to effect a reasonably rapid cure. Leper patients are an obvious inclusion in view of the hope the new drugs have created.

Too much stress cannot be made on one or other form of physiotherapy treatment in a modern hospital organisation. Thereby many patients can be discharged much sooner, and discharged in a condition which will not make them a permanent burden on the welfare services of the State. Instead of remaining helpless cripples they become useful citizens again. This is a new service to Singapore and one of outstanding importance to the public. It will be steadily expanded in consequence.

INFECTIOUS DISEASE

Middleton Hospital, the only institution for infectious disease in the Colony apart from the Quarantine Station, treated 2,317 cases in its 250 beds during the year as compared with 1,795 in 1950.

There were no cases of plague, cholera or small-pox, but 91 cases of enteric fever, 7 cases of scrub typhus, 370 cases of diphtheria and 78 cases of poliomyelitis were recorded.

ENTERIC GROUP OF FEVERS

91 cases of typhoid fever were admitted during the year. With three cases remaining from last year, 94 cases were treated with 6 deaths, a case fatality rate of 6.3 per cent.

The following shows the number of admissions and deaths by month, throughout the year.

TYPHOID ADMISSIONS AND DEATHS BY MONTHS, 1951

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
No. of Admissions ..	7	5	5	6	4	..	1	1	3	10	10	39	91
No. of Deaths ..	..	..	..	1	1	..	..	..	..	3	..	1	6

It will be noted that there were 39 admissions during December; of these, 23 had attended a common wedding dinner in a house at Paya Lebar. With the help of the City authorities 9 cooks and servers from the restaurant which supplied the dinner were detained in the hospital for investigation as suspected carriers. Blood examinations of these showed a positive *Vi* agglutination of 1/10 titre in one, and 1/320 titre in another, but all stool and urine examinations were persistently negative for *Sal. Typhi*. These two suspects were still being detained in the hospital for further investigation at the end of the year.

Chloromycetin treatment is still giving gratifying results. Of the 91 cases, 75 were treated with this material. The total dosage of chloromycetin for an adult patient is 29 grams spread out for a period of 14 days. With this treatment the temperature usually falls to normal within 72 to 96 hours from the initial dose. Three cases relapsed however, and 5 died. All the 5 fatal cases died within 24 to 36 hours after the initial dose of chloromycetin before the drug had any chance of taking effect, denoting the severity of the disease.

These deaths were complicated with the following conditions: erysipelas and broncho-pneumonia; (one case); severe bed-sores (one case); haemorrhage (one case); perforation (one case); cardiac failure (one case).

DIPHTHERIA

370 cases of diphtheria were admitted, and with 29 cases remaining, a total of 399 cases were treated during the year. 99 contacts of clinical cases with positive throat swabs manifested no clinical signs and symptoms but were detained and treated. The number of cases is a considerable increase over the average of recent years (220). In consequence very strong action is being taken to boost the immunisation campaign. Facilities are available in both rural and city clinics for preventive immunisation but the procedure is not popular. In addition many parents will not bring their children for the second essential dose. Its real importance is shown in the very high proportion of cases seen in the below 5 age group where most of the mortality occurs. Diphtheria is a preventable disease which can be eradicated by mass immunisation of the child population. This has been definitely established in such countries as the United Kingdom where the response to immunisation has been excellent, with a consequent and remarkable drop in the incidence of this dangerous disease.

<i>Types of Cases</i>				<i>Admissions</i>	<i>Deaths</i>
Laryngeal and Tracheal	...	...	...	163	72
Nasopharyngeal	...	...	...	69	18
Faucial	...	...	...	133	1
Nasal	...	...	...	5	—
Total				370	91
Contact Carriers	...	...	...	99	—

ADMISSIONS BY NATIONALITIES

<i>Race</i>				<i>Admissions (including carriers)</i>	<i>Deaths</i>
Europeans	...	...	...	4	—
Eurasians	...	...	...	8	1
Indians	...	...	...	17	2
Chinese	...	...	...	424	81
Malays	...	...	...	16	7
Total				469	91

ADMISSIONS BY AGE GROUPS

Age				Admissions (including carriers)	Deaths
1 year and below	...	...	...	31	11
1—2 years	...	...	...	91	36
2—5 years	...	...	...	198	42
5—10 years	...	...	...	91	2
10—15 years	...	...	...	37	—
15—20 years	...	...	...	5	—
Above 20 years	...	...	...	16	—

ADMISSIONS AND DEATHS BY MONTHS

		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Admissions	..	56	32	29	24	29	39	48	48	63	33	32	36	469
Deaths	..	14	7	9	7	2	7	6	1	15	7	9	7	91

Of the 370 cases, 91 died, giving a case fatality rate of nearly 25 per cent

Out of the 91 deaths 61 died within 24 hours of admission. Tracheotomy was performed on 107 cases, or nearly 30 per cent of the total. Of these 107 tracheotomies, 52 died. These figures indicate the late diagnosis and treatment which is still unfortunately such a feature of this disease. More often than not, the child is in a moribund and dying condition when admitted.

MEASLES

209 cases of measles were admitted with 18 deaths. Most of these cases were referred from public institutions where the danger of spread was present. All the deaths were due to broncho-pneumonia.

MENINGOCOCCAL MENINGITIS

4 cases with one death were recorded.

TROPICAL TYPHUS

All the seven cases were of the 'scrub typhus' variety. No deaths were recorded.

BOWEL DISEASE

	Cases	Deaths
Amoebic	105	3
Bacillary	18	3
Clinical	40	4
Diarrhoea and Enteritis	33	4
Total	196	14

ACUTE ANTERIOR POLIOMYELITIS

CASES AND DEATHS OF POLIOMYELITIS BY MONTHS

		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Cases ..	..	13	5	9	4	4	6	3	2	6	7	7	12	78
Deaths ..	..	..	..	1	2	..	2	1	..	1	1	..	..	8

After the sharp rise towards the end of 1950 the disease has been steadily endemic. It is fully reviewed in an earlier section. A battery of 14 iron lungs is retained in the various institutions of the Colony with a concentration at Middleton Hospital. This is a sufficient number for any emergency. Two of the lungs were a gift from the dealers of Nestles Milk Company in memory of the late Mr. K. E. Imrie.

AGE GROUPS, SEX DISTRIBUTION, TYPES OF CASES AND DEATHS OF POLIOMYELITIS

Age Groups		0-1 year		1-2 years		2-5 years		5-10 years		10-15 years		15-20 years		20-30 years		30-40 years		Total	
Sex		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Paralytic ..	C	8	11	13	7	12	7	4	2	..	1	1	1	1	1	1	1	40	31
	D	2	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	5	1
Non-lytic Para- ..	C	..	..	..	..	1	..	1	..	1	..	..	..	..	..	..	..	3	..
	D	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bulbar ..	C	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..
	D	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..
Abortive ..	C	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	2
	D	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	C	8	11	13	7	15	8	5	2	1	2	1	1	1	1	1	1	45	33
	D	2	1	1	..	3	..	1	..	..	..	..	..	..	..	..	..	7	1

From this table, one gathers the following:—

- (a) 62 out of 78 were children under 5 years of age.
- (b) the disease was more prevalent among the males.
- (c) a high incidence of cases with paralysis.

Four very serious cases were treated in 'Iron Lungs': one revived. All cases were retained in the hospital for physiotherapy after the acute stage of the disease was over, and two full-time physiotherapists were employed for this purpose.

Through the generosity of a grateful parent a small bathing pool about 15 ft. x 5 ft. x 2½ ft. was donated to the hospital for treatment purposes.

The infectious Disease Hospital continued to be run under the dual control of Government and City. Dr. H. R. Morrison, M.B., CH. B., D.P.H., acted as Medical Superintendent until Dr. Ng See Yook, L.M.S., D.P.H., returned from leave in August. In October a Medical Officer was seconded by Government to assist.

Average number of patients per day	...	...	107
Average number of days per patient in hospital	...	...	17
Number of rural cases	...	...	241

MENTAL DISEASE

The year 1951 again saw a considerable improvement in our approach to the various mental problems which confront the Colony.

The outstanding feature of the work undertaken was the expansion in all forms of specialised treatment, and in occupational therapy and food production. Several methods of treatment not previously in use in Singapore were added. As more staff became available it was possible to extend recognised modern treatment to more and more patients.

The main diagnostic categories remained unchanged and were in order of frequency; toxic confusional states, schizophrenic reaction types, manic-depressive reaction types, and general paralysis of the insane.

At the end of the year 17 female and 80 male criminal lunatics of all categories were in residence. This total of 97 criminal cases exceeds that of 1950 by 24 but the number does not indicate a basic increase in crime committed by the mentally ill. It reflects the general overall increase in the number of in-patients and a somewhat greater awareness by the public that patients require treatment in hospital rather than imprisonment.

During the year there were 660 direct admissions and 395 discharges. This is a discharge rate of 60 per cent which compares more than favourably with any previous year.

48 deaths were recorded over the 12 months, including two suicides, and one murder. The latter was committed by a long term chronic patient who had not previously shown evidence of impulsive violence. The remaining deaths were due to intercurrent disease.

Pulmonary tuberculosis was diagnosed and proven in 51 patients. The incidence was 3.3 per cent of all patients. This is an improvement over previous years. All cases received recognised treatment by P.A.S. and streptomycin in the pulmonary tuberculosis units of the hospital. This figure cannot be said to be excessive. An increased tuberculosis rate is the usual finding in mental institutions. A recent N.A.P.T. Bulletin records that at a meeting of psychiatrists and chest physicians held in November 1951, the reason why the incidence of this disease is seven or eight times that of the general population in mental hospitals in the United Kingdom was discussed, when lessened resistance due to fears and deficiencies was stated to be a likely cause: that these patients are forced by their condition to be in unhygienic surroundings. Idleness and unclean habits were other evils.

In spite of improved treatment technique, wider application of treatment, and a high discharge rate, the total number of in-patients increased by 227 patients from 1,200 in 1950 to 1,427 at the end of 1951.

TREATMENT

The two insulin units have been enlarged to provide treatment facilities for 16 patients in each, giving a total of 32 beds. They have worked at full capacity throughout the year and the amount of work done has been more than doubled. Patients suffering from schizophrenia predominated, with about

90 per cent receiving insulin shock therapy. The total number treated was 173. Each patient received an average of 37.71 treatments which compare with an average of 30 per patient in 1950. In all, 6,525 insulin treatments were given, while in 1950 the number was only 3,000.

The discharge rate for those who had complete remissions after insulin shock was 36.5 per cent which is slightly less than in 1950 and a great deal less than is claimed elsewhere. This is explained by the fact that cases are usually referred late in their illness due to the superstitious beliefs of large numbers of the population.

INSULIN SHOCK THERAPY

Comparison between 1950 and 1951

		1950	1951
Number of cases treated	... ..	100	173
Number of treatments	... ..	3,000	6,525
Average number of treatments per patient		30	37.71
Discharged Recovered	... ..	38%	36.47%

Electro Convulsant Therapy continued as one of the main methods of treatment. Several chronic patients received two or more courses to control exacerbations of their illness although not acting as a permanent cure. A small number of out-patients were also given treatment.

		1950	1951
Number of cases treated	... ..	309	789
Number of treatments	... ..	2,781	5,894
Average number of treatments per patient		9	7.47

In order to enable patients with physical disabilities to be treated by convulsant therapy the use of curarising drugs was introduced. An iron lung was borrowed from another hospital in case any respiratory emergency arose. No untoward effects have been observed, however. This treatment has been carried out on patients with valvular heart disease, hemiparesis, hyperpiesis, pulmonary tuberculosis, pregnancy, and fractures involving most bones. Treatment could not otherwise have been given to these patients except with very grave risk of incurring further physical injury or even death.

A series of 20—30 patients were treated by histamine shock which has been reported as efficacious in schizophrenic patients. No particular advantage seems to accrue from this method of treatment but experimental work continues.

Throughout the year investigations continued in ascertaining something of the role played by adrenal cortical extracts in insulin shock therapy. This was an extension of the successful work carried out in 1950.

Occupational therapy has trebled since 1950. New weaving equipment, large and small, arrived towards the end of the year, and considerable quantities of other therapy goods and appliances were obtained. Occupational therapy is divided into three main portions; the outside farm and garden work done by male patients only; male inside workers: and the female division.

Male occupational therapy has been expanded to include seven whole-time patient tailors, and two paid tailors who are in charge. The tailors do all repairs to male clothing, bedding, towelling, linen and mattresses. In addition to repairs this 'shop' makes all male patients clothing, bedsheets, pillow-slips, strong suits, etc. Two-piece suits for a total of 923 male patients were completed during the year.

REPAIRS DONE BY MALE PATIENT TAILORS, 1951

<i>Articles repaired</i>	<i>Number repaired</i>
Coats ...	20,500
Trousers ...	13,200
Strong suits ...	48
Blankets ...	130
Pillow cases ...	400
Bed sheets ...	200
Mattresses Remade ...	60
Mosquito nets ...	12
Window curtains ...	20

In the newly opened male workshop two locally trained handicraft workers are in charge of some 30 patients. During the six months this scheme has been in operation the following articles have been made or repaired:—

<i>Assorted articles</i>
New basketry ...
New carpentry ...
Major rattan repairs ...
Major wood repairs ...
Minor repairs ...
Painting and varnishing ...

In previous years articles listed under 'major repairs' would have been condemned as unusable. Broken down rattan and wooden articles were 'cannibalised' to nearly new goods at no cost to the hospital.

Male patients were also responsible for the production of some 55,000 lb. weight of green vegetables from the farm and gardens.

The female side made a total of 650 soft goods valued at \$1,054 for sale to the public. The profits covered all expenditure and provided extra comforts for those patients carrying out the work. The sewing room made a total of 6,700 new garments for female patients. Women remade and repaired 600 coir mattresses and repaired 7,000 pieces of clothing and linen in addition to minor items. They washed and ironed approximately 111,000 lb. dry weight of various items of female apparel, bedding, etc. and ironed 56,000 staff uniforms.

The hospital farm has been greatly extended in area and intensive cultivation has been carried out. About 10 acres are now under rotation crops, mostly of fresh vegetables for patients' consumption. The groundnut crops have been smaller during the year as the soil has been required for other plants. The soil is poor in parts and requires much manure and tilling. New agricultural equipment is on its way and will replace the not very efficient and laborious methods now in use. It will then be possible to further extend the farm and to make each acre produce several crops per year.

A saving to the public of some \$7,000 is not much in our overall expenditure but it is expected that in future years all the vegetables required will be produced by the hospital itself. More important however is the fact that outside farm work is a recognised therapeutic and rehabilitating measure for mental patients. So in addition patients who are unable to leave their wards for various reasons now have small vegetable plots in their ward compounds.

The following table compares the cost per day in Straits dollars of feeding a patient in 1949, 1950 and 1951. The rise in cost has been steady and is only partly offset by hospital food production.

<i>Class</i>	<i>1949</i>	<i>1950</i>	<i>1951</i>
	\$ c.	\$ c.	\$ c.
Paying (a) ...	2 50	2 76	3 30
Paying (b) ...	1 30	1 60	1 90
Free ...	75	83	1 10

COLONY OF SINGAPORE

VEGETABLE GARDEN PRODUCTION FOR THE YEAR 1951.

Month	Bayam puteh	String beans	Brinjals	Sweet potatoes	Kang- kong	Coco- nuts	Papa- yas	Pump- kins	Peanuts	Tapioca	Cucum- ber	Turnips	Ram- butan	Chinese carrots	Total	\$
	lb.	lb.	lb.	lb.	lb.	pcs.	pcs.	lb.	lb.	lb.	lb.	lb.	lb.	lb.		c.
January ..	996	22	24	615	237	(58)	(6)	..	..	..	..	..	..	..	1,893	139 01
February ..	429	180	259	290	278	..	..	..	..	..	..	..	..	..	1,416	98 68
March ..	500	15	110	351	234	(60)	..	..	731	..	..	..	..	..	1,941	451 84
April ..	2,000	119	18	446	333	..	..	..	500	700	..	..	..	..	4,116	497 70
May ..	4,428	80	100	466	324	(70)	..	19	..	195	..	..	..	..	5,612	466 10
June ..	2,894	480	152	1,410	198	..	..	..	..	..	..	..	..	..	5,370	491 49
July ..	4,728	13	90½	1,099	296	(72)	..	..	..	..	..	..	..	..	6,226½	920 38
August ..	4,252	174	57	110	499	..	..	..	..	..	..	..	..	..	5,092	806 41
September ..	4,155	53	..	304	281	..	..	318	..	..	187	..	..	..	5,198	818 48
October ..	3,604	268	..	81	249	..	..	141	763	1,525	297	212	..	..	7,122	1,200 00
November ..	3,466	82	597	1,511	249	(80)	..	52	103	..	..	48	160	..	6,268	900 00
December ..	1,982	205	111	1,489	479	..	..	40	..	..	..	..	..	25	4,331	693 38
Total ..	33,434	1,691	1,518½	8,172	3,657	(340)	(6)	570	2,097	2,420	484	260	160	25	54,585½	7,483 47

During the year the Dental Surgery unit continued to function one morning per week. The work is mostly of an extractational nature but considerable conservation is maintained. The unit cares for a number of lepers requiring urgent treatment in addition.

DENTAL TREATMENTS

			<i>New cases</i>	<i>Revisits</i>	<i>Total</i>
Male mental patients	...	...	203	282	485
Female mental patients	...	...	153	309	462
Male lepers	...	...	14	3	17
Female lepers	...	...	19	18	37
Total	...	...	389	612	1,001

Dental sepsis is a major factor in ill health in this hospital and its removal has been most effective both physically and mentally in many instances.

LABORATORY

<i>Microscopical examinations</i>			<i>Number of tests</i>	<i>Number of Kahn tests</i>	
Blood	...	...	1,196	C.S.F.	510
Urine	...	...	3,080	Blood	510
Faeces	...	...	1,356		
Sputa	...	...	1,956		

The Kahn tests confirmed the clinical diagnosis in 119 cases of general paralysis of the insane, indicating the importance of a syphilitic history in many mental patients.

Adult education was extended to patients for the first time in line with the most advanced practice elsewhere. A voluntary patient, who was a school teacher took a class in English for some months. Considerable interest was shown and a number of cases appeared to benefit from instruction to a marked degree.

Adult staff education was continued as before but unfortunately interest flagged and only a small number of keen members continued. These now attend extra-mural classes.

Staff problems eased during the year for two main reasons. It was possible to recruit seven fully qualified supernumerary sisters and two trained nurses. These additions relieved the male nurses and hospital assistants from duty in the male insulin ward and elsewhere, enabling the latter to devote more time to the remaining male patients. Then many hospital servants were up-graded to hospital attendants and given a better salary scale. This resulted in more contentment with an increase in efficiency and better treatment of patients.

The chronic shortage of medical officers in this difficult speciality was relieved somewhat by the employment of a married woman doctor on a temporary basis. The hospital with only four medical officers remains seriously under-staffed in this respect.

Medico-legal work has greatly increased and frequent attendances at Court have been necessary. The most common cases are women suffering from puerperal psychosis who have murdered or attempted to murder their children, or have attempted suicide. As there is no Infanticide Act in force the more serious charge of attempted murder or murder had to be preferred against these unfortunates. Representations have been made in this connection and new legislation to avert this anomaly is under consideration.

The nationalities of patients remaining in hospital at the end of the year are shown on page 188.

NATIONALITIES OF PATIENTS

Nationality	Remained on 31-12-50		Admitted during 1951		Total treated		Discharged		Died		Remained on 31-12-51	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Europeans..	2	..	7	5	9	5	6	4	..	..	3	1
Eurasians ..	9	6	11	8	20	14	12	7	..	..	8	7
Chinese ..	543	465	326	177	869	642	152	122	30	12	687	508
Indians ..	85	14	56	25	141	39	46	7	2	3	93	29
Malays ..	57	15	33	10	90	25	21	4	..	..	69	21
Others ..	13	1	1	1	14	2	13	1	1	..	..	1
Total ..	709	501	434	226	1,143	727	250	145	33	15	860	567

Mental disease is without doubt one of our main social and medical problems today and there is little question that the delay in the implementation of the Medical Plan may make its extension in this direction imperative in due course. Some 2,000 beds with 150 additional beds for mental defectives are envisaged under the scheme. Occupied beds have increased from 440 in 1946 to over 1,400 today in spite of the introduction of modern treatment methods. It has not been possible to introduce the mental defective scheme as yet, but indications now are that the 150 beds envisaged will be rapidly filled and that an approach to this problem is one which cannot be unduly delayed.

The existing hospital was designed to take 2,000 beds but modern ideas indicate that such overcrowding would seriously interfere with the chance of recovery of many of the inmates. In past decades the idea was mainly incarceration: today this includes modern treatment and an attempt to cure as many as possible.

Proper nursing is a vital part of mental treatment today and in consequence the necessity of relying on the pre-war scheme of a large hospital servant class only has been a source of constant anxiety to the medical directorate. In an effort to relieve this deficiency more trained supernumerary sisters were employed. Two hospital assistants were sent to United Kingdom for specialised training. A new scheme of promotion and salaries was devised for attendants whereby selected servants were promoted for training on an enhanced pay. There is no doubt that these measures have gone a long way towards improving the standard of attention available in our mental institution, but there is still much to be done in view of the importance of new treatments. The neglect of past decades and the continuing shortage of nurses must continue to make progress slow in this respect.

Food and cooking is always a problem in such a large institution with such a type of patient, but there is no doubt that there can be no complaint of lack of quality or quantity today in spite of the fact that the existing kitchens are completely outmoded. These make a continuing good standard of food a difficult matter however and one which may well become acute as more and more patients have to be dealt with. In consequence a really up to date cooking system must soon become a priority.

The existing Mental Disorders Ordinance has been outdated for some time now and a draft Bill on the most up to date lines has been prepared. This provides for temporary detention and treatment without certification, a most necessary and desirable provision.

Preliminary work has been carried out in drafting a Mental Deficiency Ordinance also, as there is none in existence at the moment. The incidence of mental deficiency is thought to be high and numerous cases are referred for opinion. At present there is no method of dealing with these patients, whether adult or juvenile, nor is there anywhere for them to go. Mental defectives help to swell the ranks of the petty criminal, the prostitute, the unemployed, the shiftless good-for-nothing and the delinquent. Thus an institution for defectives cannot be long delayed as these unfortunates cannot care for themselves and are a burden on many of the poorer families. They are without doubt a major factor in delinquency and in the spread of communicable disease. They are incapable of maintaining a proper personal or household hygiene and thereby encourage the breeding of vermin. Mental defectives and similar over-suggestible types readily fall prey to the blandishments of criminals and political undesirables of higher intelligence, and are used as

expendible tools in crime. Rarely does a week pass without some mental defective being dragged to court as a result of some crime suggested to him by others. Such people should be treated rather than punished.

The mentally ill, whether defective, psychotic or psychoneurotic, cause greater loss of man-hours, of money and of efficiency than any other single chronic disease entity, not excluding tuberculosis. Most chronic illnesses either resolve, or the patient dies relatively early: the mentally ill remain a charge on the community for 30 to 40 years.

Arrangements have been made with the police whereby a person found wandering, or committing some offence, and considered to be of unsound mind, is sent immediately for mental observation prior to being charged before a magistrate. This enables such patients to be dealt with in the most expeditious and satisfactory manner to all concerned.

A parole system for patients has been instituted. Coloured badges are issued to individual patients on merit and these are allowed to leave hospital on weekly passes to visit the city or places of entertainment.

Final year medical students attended in the Michælmass term as usual for a course of instruction in mental disease.

As for activities on the lighter and recreational side, the Annual Sports Day was well attended and patients, whether participants or spectators, thoroughly enjoyed the afternoon. The Staff Football XI was runner-up in the 3rd Division of the local league. So it has now been raised to the 2nd Division and hopes to do even better next year.

Medical Superintendent: Dr. J. Browne, M.D., CH.B. (Q.U. Belfast).

PATHOLOGY DIVISION

The work of this division includes:—

- (a) autopsies (H.M. Coroner and hospital cases) at the General, the Tan Tock Seng and Kandang Kerbau Hospitals;
- (b) histological examinations of biopsy and autopsy specimens from the Government hospitals, clinics, dispensaries, and private practitioners;
- (c) bacteriological investigations of specimens from Government hospitals, clinics, dispensaries, and private practitioners;
- (d) serological tests of blood and cerebro-spinal fluids from Government hospitals, clinics, dispensaries and private practitioners;
- (e) preparations of T.A.B., cholera and autogenous vaccines for the use of Government hospitals, clinics, dispensaries and private practitioners;
- (f) maintenance of a museum of specimens of pathological and medico-legal interest;
- (g) friedman tests for pregnancy;
- (h) maintenance of stock cultures of bacteria.

TEACHING

The major part of the teaching of Pathology to medical and dental students of the University of Malaya has to be undertaken by this division as the posts of Professor of Pathology and two senior appointments continued to be unfilled. The number of students attending Pathology during the year was 69 (Medicals 53 Dentals 16).

The teaching of Forensic Medicine to the students was carried out by the senior assistant (Dr. L. S. da Silva). The number of students who attended this course was 48.

It is to be noted that the work done in this laboratory is not representative of Singapore as a whole, because similar examinations are carried out at the City and Command laboratories. Further all biochemical and a large number of clinico-pathological and hæmatological investigations are carried out in the clinical laboratories of the individual hospitals and dispensaries.

TOTAL NUMBER OF YEARLY INVESTIGATIONS

	1947	1949	1951
1. Post-mortems	1,047	1,351	1,876
2. Histological Examinations ...	1,860	3,043	3,260
3. Bacteriological Examinations .	5,338	6,352	10,854
4. Serology	20,404	27,915	40,421
Total ...	28,649	38,661	56,411

Post-mortems of H.M. Coroner's cases 758.

The Senior Pathologist was in charge of the Government division and continued to act as Head of Department of Pathology, University of Malaya, throughout the year. Dr. L. S. da Silva who had been on study leave returned in September 1951, after obtaining his Diploma in Bacteriology at Manchester University. Mr. V. Nalpon, Laboratory Assistant, also returned in October, from a course of study overseas.

Though there are a number of pathological conditions of interest which the Senior Pathologist would like to study, the burden of the ever increasing routine coupled with the strain of teaching to a large number of students, leaves little time for these investigations. The staff of four available from Government and the University is ludicrously small for the purpose.

GENERAL

Post-mortem examinations

1874 necropsies were performed during the year, an increase of 170 on the 1950 figure (1,706). The number of necropsies in Coroner's cases was 849, an increase of 18 on the 1950 figure (831). Coroner's cases thus form about 45 per cent of the total post-mortems undertaken.

AGE, SEX AND RACE INCIDENCE OF AUTOPSIES (CORONER AND WARD CASES)

Age	Chinese		Indians		Malays		Others		Total		Grand Total
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
0- 1 year	318	258	12	15	1	2	2	1	333	276	609
1-10 years	149	114	3	..	5	2	..	..	157	116	273
10-20 "	42	23	2	4	1	3	1	..	46	30	76
20-30 "	68	31	13	4	6	1	4	2	91	38	129
30-40 "	112	36	29	4	9	..	1	1	151	41	192
40-50 "	142	48	38	3	7	..	9	2	196	53	249
50-60 "	123	31	29	1	4	1	7	..	163	33	196
60-70 "	57	12	2	1	1	..	2	1	62	14	76
Over 70 years ..	12	6	..	1	1	..	2	1	15	8	23
Total	1,023	559	128	33	35	9	28	8	1,214	609	1,823

Autopsies on Decomposed Corpses 51

Grand Total .. 1,874

The following figures indicate the small number of cases from some of the more interesting and common conditions now seen in the post-mortem room and give further proof of the beneficial effects of modern anti-malarial and other preventive measures coupled with the advance in therapeutics. The number of deaths from poisoning showed a very gratifying drop from 95 in 1950 to 53 in 1951, the number of deaths from caustic soda poisoning falling from 75 to 34. The number of deaths from malignant tumour shows some increase as does that from vehicle accidents.

			1950	1951
Tuberculosis	...	...	155	154
Malignant Tumours	...	...	82	103
Malaria	...	...	5	7
Beri Beri	...	...	13	19
Amœbiasis	...	...	10	12
Bacillary Dysentery	...	...	5	7
Typhoid	...	...	9	8
Diphtheria	...	...	8	7
Poisoning	...	...	95	53
Vehicle accidents	...	...	97	115

Histology

The total number of sections examined during the year was 3,260, a decrease of 93 on the 1950 figure. The total number of blocks prepared was 4,421 out of which all the biopsy blocks (2,851) were examined. A large proportion of the autopsy blocks had to be left for future sectioning and reporting however. Until the staff position improves such arrears of work must be expected.

Bacteriology

The number of specimens investigated during the year was 10,851, an increase of 607 on the 1950 figure. Cultural and animal inoculations for myco-tuberculosis from the General and Tan Tock Seng Hospitals continued to form a large percentage of the work done by this division—2,406 specimens. The amount of vaccine prepared was 16,480 c.c. a reduction on previous years, but action was proceeding towards the end of the year to increase very considerably this side of the division's work, particularly for stockpiling and emergency purposes. Pregnancy tests (Friedman's test) was done on 103 cases with 51 positive, 47 negative and 5 doubtful.

Stock cultures composed of Oxford and local strains numbering 141 were maintained during the year.

Five strains of leptospira were isolated from guinea pig inoculations (72 animals in all were inoculated).

Serology

The total number of specimens examined was 40,421 consisting of 37,981 blood and 2,440 cerebro-spinal fluids, an increase of 3,814 on the 1950 figures.

Senior Pathologist: Dr. C. Subrahmanyam, L.M.S. (Singapore).

BLOOD TRANSFUSION SERVICE.

The Blood Transfusion Service in Singapore has shown a very substantial expansion in the scope of its activities every year since the liberation, and 1951 has proved to be no exception in this respect. Unfortunately, however, the demand for this vital service from the hospitals continues to exceed the supply, a situation which has been aggravated by the reduction in the amount of blood plasma available from overseas. Action is being taken to try out synthetic blood plasma: this is a good deal more expensive than the natural product however. The machinery for making blood plasma locally is extremely

expensive, and such material is very extravagant on the blood bank. In consequence it will not be possible to indulge in an expansion in this direction in Singapore until many more donors are available. In addition there is now the necessity of stockpiling our synthetic plasma for emergency purposes.

It will be noted that while most of the persons who receive emergency blood are Chinese still less than half of the blood donated came from this section of the population. The Chinese response showed an improvement on any previous year, but only by a constant effort. Without this effort the donor service would almost cease. Early in 1949, in an attempt to overcome this difficulty, an advisory voluntary committee was formed by the Department. The enthusiasm and drive of its members is to be particularly recorded: its work and co-operation is a happy reminder of what can be done in the field of voluntary assistance to a Government Department in the medical sphere. Mr. George E. Lee donated \$5,000 to start a special propaganda drive through his colleague on the Committee, Mr. Ong Eng Lian, and Messrs. Shaw Brothers gave free and willing service in producing a propaganda film which was shown in Singapore's cinemas during the Chinese New Year. Through the generosity of the East Asiatic Company, Nestles Limited and Peter Jackson & Company donors are provided with free beer, coffee, milk and cigarettes. The Committee worked out details of a special propaganda drive to coincide with Chinese New Year during which all donors, past and future, received due recognition according to the number of donations of blood each had provided by means of certificates, badges and medals, a form of recognition which has now become a permanent feature. The valuable assistance of the Public Relations Secretary and his staff has been noted by the Committee in this connection.

The Secretary-Supervisor of the Transfusion Unit has to spend much of her time in the effort of persuading the public to come forward as donors through personal contact. Ward Sisters and Nurses of the Hospital Service also attempt to get all friends and relatives of patients who have received blood to come forward. It was felt that many more people in this category should be available to replace the blood in the bank. Too much reliance has still to be placed on the generosity of the Armed Services which continue their admirable support in spite of the fact that the British Military Hospital now has its own Blood Bank. In the latter half of the year a drive was made to obtain more Asian donors, and it met with some success. Malay Other Ranks from Army units, the Police Training School, the Customs Department, and the University have provided more donors than in previous years. Like other countries in the British Commonwealth we still rely far too much on the altruistic few in this as in other respects. No monetary awards are given to our Blood Donors and nothing is charged for Blood Transfusions given in the hospitals. The Blood Transfusion Service is supported entirely by the Government for the benefit of the people of the Colony.

A Mobile Unit has been used to a limited extent for collecting blood from outlying groups, but on the whole it is more satisfactory for the donors to come to the Transfusion Centre.

As in the past, all would-be donors are questioned with regard to their previous health record and examined by the Medical Officer. If they are found to be unfit they are rejected. No person with a hæmoglobin of below 85 per cent (Salhi) is accepted.

A filing system is maintained and donors who have expressed their willingness to return, are sent reminders and requests to make appointments, but care is taken not to call on them within six months of a previous donation. Many do return without having to be reminded and a fairly good panel of 'regular donors' has been built up.

The English and Vernacular press and Radio Malaya have helped during the year by giving us publicity in the form of reports, features and appeals and the weekly publication of the Blood Bank Balance.

Managers of large firms and Heads of Government Departments have been sent letters asking them to help by permitting their employees to come to the Centre during working hours. In some cases and notably with Imperial Chemical Industries (M), Limited, Malayan Tobacco Distributors, Limited, Shell Company (Singapore), Limited, the Police Training School, the C.I.D. and H.M. Customs, the response has been very good. A good deal of publicity is still needed to enlighten and educate the local population who are still too often deterred by fear and ignorance and superstition.

Campaigns to enrol new donors were held in conjunction with two Exhibitions:—

Safety First Week with a good response.

A Trade Exhibition at the Happy World with only a fair response.

It is felt that sustained publicity and personal contact are needed rather than isolated campaigns.

One of the main difficulties continued to be that of a constantly changing staff and every effort will have to be made to make the personnel permanent if such an important activity is to be efficiently run. Once the necessary training has been acquired, it is essential that technicians and others remain.

Work done consists of:—

- (1) the taking and storage of blood;
- (2) blood grouping. Prior to 1949 the 'tile' method of blood grouping had been employed but the more accurate method of 'tube' grouping is now in use. There are four blood groups common to all human beings, namely AB, A, B and O. If a patient requires a transfusion he should be given one of his own blood group, but if this is not available a transfusion of group 'O' (commonly known as the 'universal group') can be substituted. 'O' blood may also be used in case of emergency where a specimen of the patient's blood is unobtainable;
- (3) hæmoglobin estimations and blood counts;
- (4) examination of blood films;
- (5) kahn testing;
- (6) direct and cross-matching;
- (7) blood cultures;
- (8) testing for the Rhesus Factor. The red blood corpuscles of a percentage of persons contain a factor known as Rhesus (Rh.), but normally human plasma contains no anti-Rh. agglutinins. Consequently hæmolysis will not occur when Rh. positive blood is transfused into an Rh. negative recipient. There may, however, be a slow formation of anti-Rh. agglutinins in the recipient, and if after a long interval a further transfusion from an Rh. positive donor is given these anti-Rh. agglutinins may produce serious hæmolysis. Steps have been taken to complete a panel in this respect;

ANALYSIS OF DONOR TOTALS, 1951

Nationalities	Total	Male	Female	O	A	B	AB	DONOR		RELATIVES		RELATIVES			HBP.	Ven.	Nil	Kahn	H.T.	Rh-ve.	Service Person- nel.
								Rej	Taken	Rej	G.H.	K.K.	Others								
														Positive							
European	1,586	1,467	119	789	566	173	58	47	17	..	12	5	23	35	..	16	4	15	239	1,030	
Chinese	1,003	933	70	448	243	262	50	35	271	101	182	167	..	57	32	31	37	8	..	42	
Indian	426	421	5	151	87	154	34	21	82	26	39	64	5	18	5	16	26	1	13	55	
Malay	382	378	4	138	89	123	32	21	24	11	10	25	..	3	1	16	47	..	..	130
Eurasian	265	222	43	132	44	62	27	9	15	2	10	6	1	28	1	4	6	2	9	19	
Others	33	32	1	17	12	3	1	..	8	1	7	2	..	..	..	..	2	1	1	1
Total	3,695	3,453	242	1,675	1,041	777	202	133	417	141	260	269	29	141	39	83	122	27	262	1,277	

1949 .. 2,946
1947 .. 996

ANALYSIS OF RECIPIENT TOTAL, 1951

Nationalities	Total	Male	Female	O	A	B	AB	Emr. "O"	G.H.	K.K.	T.T.S.	Others	Discarded
European	42	15	27	13	21	8	..	4	23	13	1	5	234
Chinese	2,399	734	1,665	1,140	664	470	125	295	1,019	1,313	43	24	141
Indian	406	120	286	180	78	127	21	43	151	246	2	7	75
Malay	187	38	149	93	36	34	24	34	50	133	2	2	85
Eurasian	70	28	42	17	22	31	..	5	30	33	7	..	39
Others	15	10	5	7	4	4	..	1	11	4	..	..	2
Total	3,119	945	2,174	1,450	825	674	170	382	1,284	1,742	55	38	576

ANALYSIS OF DISCARDED BLOOD

1949 .. 2,550
1947 .. 725

Nil .. 83
Serum .. 27
Kahn positive .. 122
Haemolysed .. 344

Total .. 576

- (9) preparation and issue of packed cells;
- (10) preparation of liquid plasma;
- (11) preparation of anti-coagulant solutions;
- (12) fragility tests on stored blood;
- (13) the preparation, dismantling, cleaning and sterilisation of blood-giving, venesection and intravenous sets for the Singapore hospitals;
- (14) preparation of double-distilled water;
- (15) investigation of blood transfusion reactions;
- (16) tests for antibodies;
- (17) preparation of 'A' and 'B' testing sera.

During the year no case of reaction due to incompatible transference occurred.

All recipients and donors are now Rhesus tested using Ledele (commercial) Serum, and Serum from the Lister Institute in London. A panel of known Rh-ve. donors is being built up and now a small stock of Rh-ve. Group 'O' blood is always kept for emergency use both in the Blood Transfusion Centre at the General Hospital and at Kandang Kerbau Hospital. Rh-ve. blood of other groups is also kept in reserve when possible, together with a list of suitable known donors who can be contacted when necessary.

A small bank is kept at Kandang Kerbau Hospital in charge of a Sister. The matching is done in the Blood Transfusion Centre, and a van goes between the two hospitals two or three times a day. A stock of emergency Group 'O' Rh. positive and Rh. negative blood is always kept at Kandang Kerbau Hospital. The emergency Rh-ve. Group 'O's are used for patients other than the Chinese, in whom the Rh-ve. factor is extremely rare.

RESEARCH

During the year two Chinese Rh-ve. subjects were found in routine tests—both women patients. Neither had made antibodies, although both had had several pregnancies.

One patient, a Chinese woman who had seven transfusions, was found to have made a rare antibody, Anti-E, and our findings were confirmed at the Lister Institute. All her 'donors' were genotyped and the source of the antibody was found.

An increasing number of requests are made for Rhesus testing in antenatal patients, and for tests for antibodies in Rh-ve. subjects.

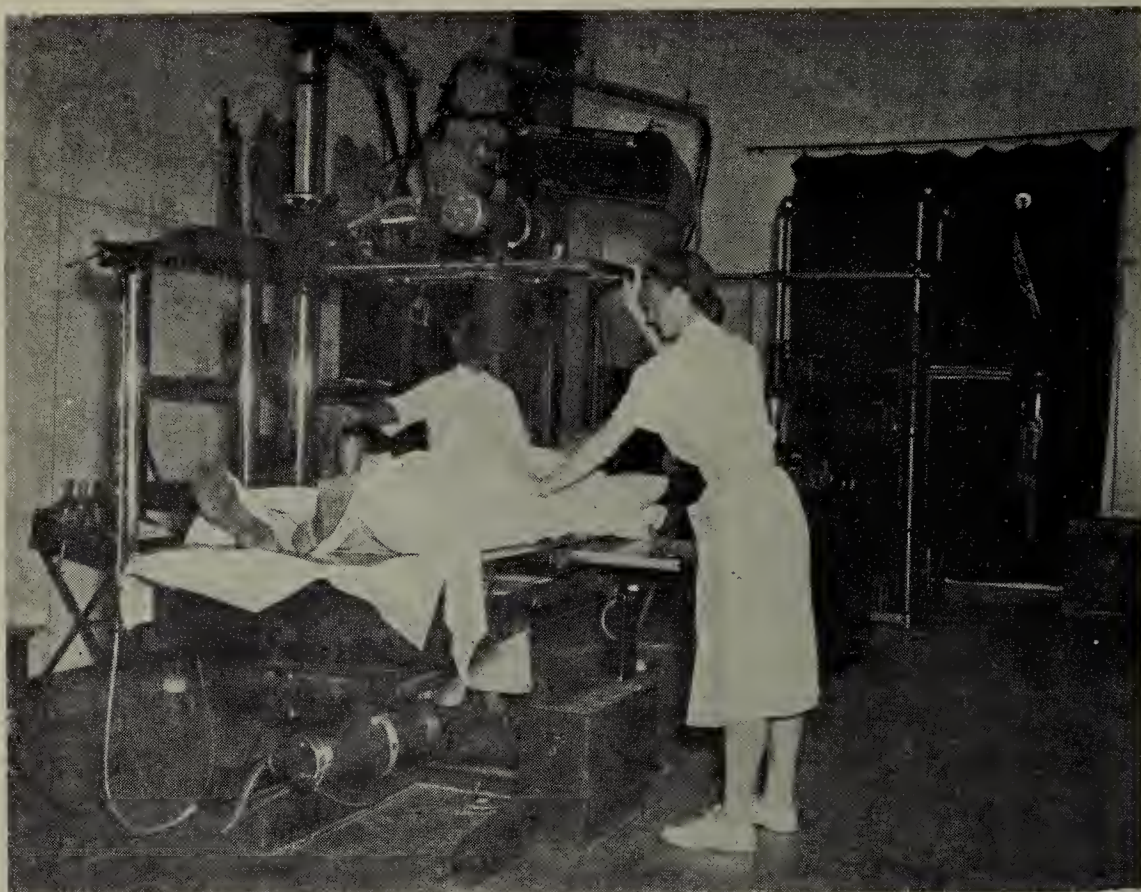
There are at present two women, one a Sikh and the other a Tamil, who are pregnant and have Rh. antibodies. Preparation is being made to transfuse their infants when they are born.

Several requests by various doctors have been made for the investigation of Chinese parents who have had and lost babies suffering from Icterus Gravis Neonatorum. These and several babies in the hospital suffering from the disease, have been investigated with their parents. Not a case has been found due to the Rhesus factor. Some specimens were sent to the Lister Institute but our findings were confirmed and nothing else definite found. Several jaundiced babies were successfully transfused in the Children's Ward. It is apparent that hæmolytic disease of the new born does occur in the Chinese and must be caused by other than the classical pattern of Rh-ve. mother immunised by Rh-ve. fœtus which accounts for 98 per cent of the cases in Europe. Here is an interesting field of research waiting to be investigated.



Public Relations

Settlement for Leprosy Patients



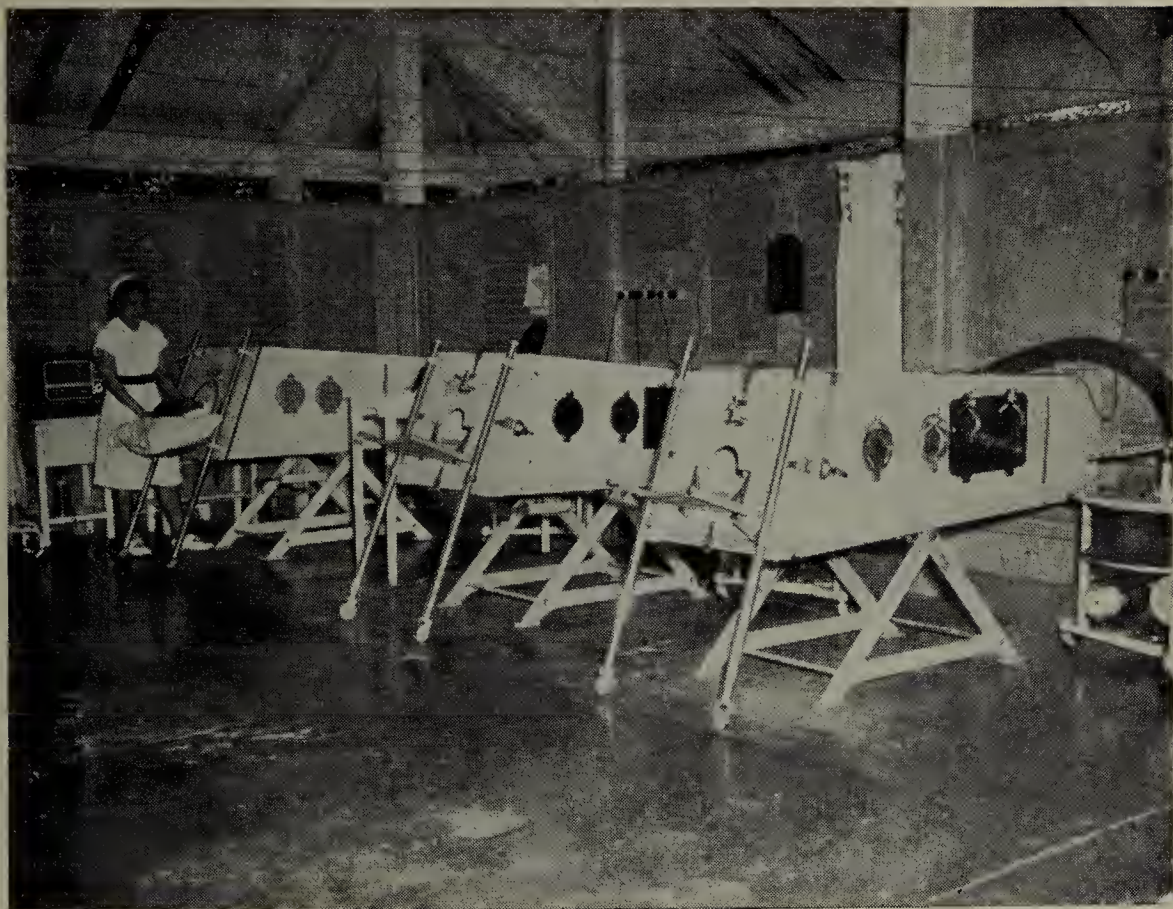
Public Relations

X-ray Department, General Hospital



Public Relations

Occupational Therapy Department, General Hospital—Section on Physiotherapy



Public Relations

A battery of Iron Lungs



Public Relations

Post-polio Physiotherapy



Public Relations

16-bedded Male Insulin Shock Therapy Ward, Woodbridge Mental Hospital



Public Relations

Mental Occupational Therapy

THE RESULTS OF RH-TYPING DONE DURING THE YEAR

<i>Rhesus Typing</i>	<i>Donors</i>	<i>Recipients</i>	<i>Donors, Rh-ve.</i>
Europeans	1,586	42	239
Chinese	1,003	2,399	—
Indians	426	406	13
Malays	382	187	—
Eurasians	265	70	9
Others	33	15	1
Total	3,695	3,119	262

Tests for antibodies are now being done on all Rh-ve, pregnant women and where possible on other recipients and donors. They will in future be issued with a special card similar to that issued in Great Britain.

The Service continues to be housed in accommodation which is both inadequate and unsuitable in rooms set aside in the Pathology Division. Although all that can be done to improve the accommodation has been done, the fact has to be faced that further real expansion cannot be attempted until a proper building has been provided for this purpose. Such a building is a part of the new out-patient division which is expected to be ready early in 1953.

Six years' experience has made it clear that a Chinese community will never supply enough blood for the developing hospital services. Thus while every effort must be continued to expand the local service in this respect, a synthetic bank must be raised in addition now that this form of substitute is coming on the market in sufficient quantities, although such material will never equal the human product. This is especially important in connection with Civil Defence needs. Steps are proceeding in this connection.

Retaining Donors—It is of primary interest to take care of the donor's general interests and health. This is accomplished by the following methods:—

- limitation of calls made on donors. An accurate filing system is maintained, and donors are called strictly in rotation;
- donors' criticisms, suggestions and complaints are sympathetically dealt with. This personal interest in, and sympathetic treatment of, the donor at the time of his attendance to give blood goes a long way in ensuring that he will return;
- the Medical Officer examines every donor. If the donor is found to be unfit he is rejected;
- recognition of 'Service': Donors are given a certificate at their first attendance, and thereafter a numbered enamel badge until the tenth donation is reached, when a silver medal is presented. On the eleventh to nineteenth donations the enamel badges continue, and at the twentieth donation a gold medal will be given. Eighteen silver medals were presented during the year.

Blood Transfusion Officer: Dr. (Mrs.) N. M. H. Gibson-Hill, M.R.C.S. (England), L.R.C.P. (London).

PRISON HOSPITALS

Both Outram Road Gaol (also referred to as Pearl's Hill Prison) and Changi Prison have small hospitals attached to them where sick offenders are treated. In addition there is a detention ward in the General Hospital for more important cases, and the police have under their control a certain number of detainees in a camp on St. John's Island who, if requiring medical attention, are dealt with by a visiting staff from Outram Road Gaol.

OUTRAM ROAD GAOL

The general health of the inmates and the sanitary condition of the Prison were satisfactory throughout the year. There was no epidemic of any kind; only three sporadic cases of chicken pox and three of mumps were reported. Twelve cases of pulmonary tuberculosis were transferred to Changi Prison for treatment.

An average of 10 out-patients per day were seen by the medical officer. In addition the hospital assistant dealt with approximately 100 cases daily on his rounds.

The average daily number of inmates in the Prison was 1,056. The total number of cases admitted to the Prison Hospital was 1,234, the daily average being 42. There was no significant difference in the disease incidence compared with the two previous years, the main complaints being from skin and minor respiratory conditions. 100 cases of so called opium addiction were admitted for observation. These were mostly from the ranks of the trishaw-pedallers.

Seven cases of fairly well-advanced avitaminosis were seen during the year—five being vagrants and two trishaw-pedallers.

69 patients were transferred to the General Hospital for treatment; nine to Woodbridge Hospital, and four to Trafalgar Home.

There were three deaths in the Prison, two from heart failure and one from lung abscess.

About 400 inoculations and 4,200 vaccinations were done in the Prison.

An out-patient clinic was opened outside the Prison in April, 1951, for treatment of sub-warders and their families. The clinic is open six days of the week from 8 to 9 a.m.; the average attendance since its opening has been seven per day.

The medical officer made weekly visits to the detainees on St. John's Island, and treated an average of 15 out-patients per visit. The hospital assistants on the Island treated an average of 12 out-patients per day.

A dental surgeon visited the prisoners weekly and treated a total of 869 cases—596 extractions, 221 fillings, and 25 dentures. Dental cases treated on St. John's Island totalled 396—176 extractions, 234 fillings, with seven dentures.

CHANGI PRISON

The general health was satisfactory throughout the year. No epidemic of any kind occurred.

The daily average number of offenders in this prison was 756. The number of cases admitted and treated in the prison hospital was 276 as against 280 for 1950 with a daily average of 23: 18 of these were tuberculosis cases. If the tuberculosis patients are excluded the daily average would be only five patients.

The total number of out-patient attendances was 33,089 from 1,565 new cases. The daily average number of out-patients was 90 as against 122 for 1950.

Apart from the tuberculosis the principal diseases treated were influenza, nasal catarrh, abscesses, diarrhoea and injuries. No deaths were recorded.

56 operations were performed (three major and 53 minor) against 193 for 1950. Dental extractions, fillings, etc. numbered 469.

The diet is ample and very well balanced and no nutritional or vitamin deficiency was detected. Boils a common complaint in previous years have been rarely seen since Red Palm Oil was added to the diet. Extra diet in the way of eggs, milk, bread and butter are supplied to the sick.



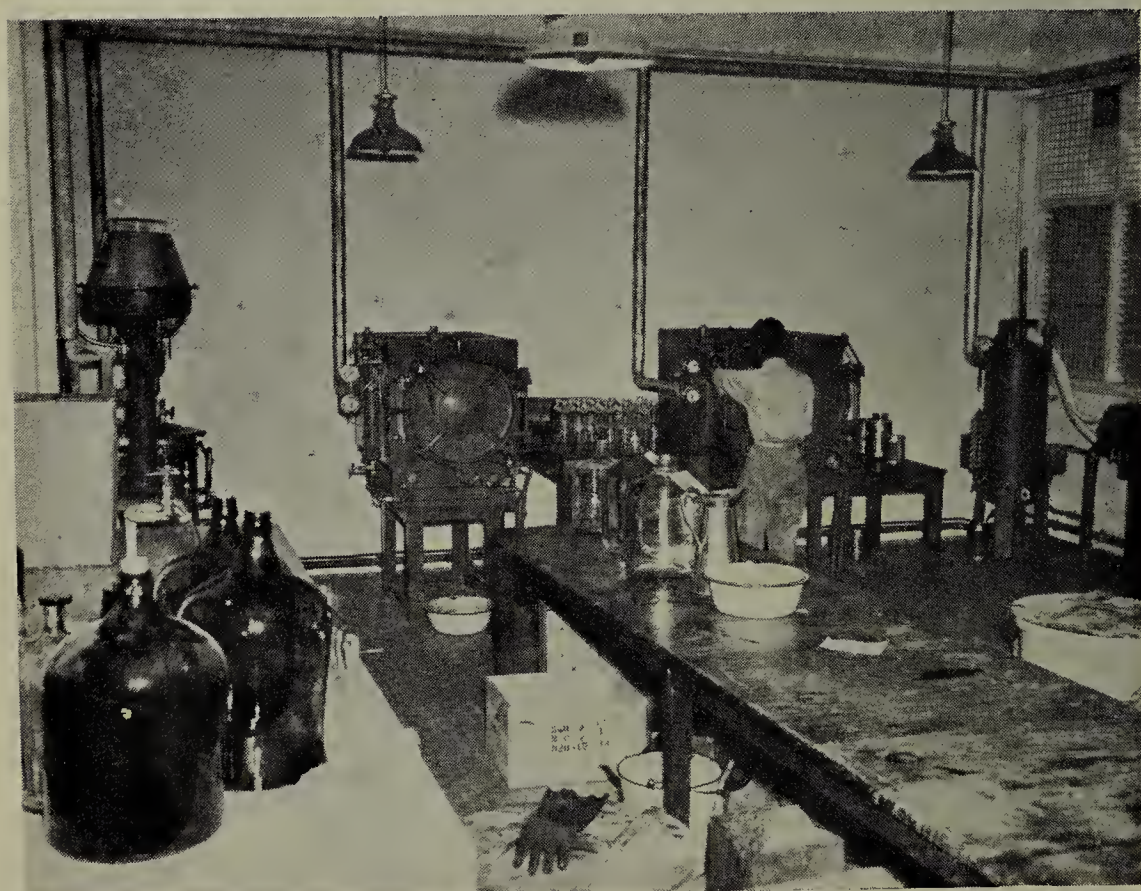
Public Relations

Woodbridge (Mental) Hospital, Ground-nut Garden



Public Relations

Government Medical Store, Sterile Preparation Room



Public Relations

Government Medical Store, Manufactory Section

Mattresses, bed sheets and pillow slips are supplied to the hospital as well as pyjamas for the sick. The hospital being the most comfortable place in the prison it is not surprising that offenders try to get admitted for the most trivial reason.

POLICE HOSPITAL

A total number of 471 in-patients were treated in the Police Hospital as compared with 825 in the previous year. Total attendances at out-patient clinics were as follows:—

—		New Cases	Repetitions	Total Attendances
Hill Street, Families Clinic	...	2,714	14,252	16,966
Police Training School	...	3,193	10,894	14,087
Total	...	5,907	25,146	31,053

There were 31 police wives confined in barracks compared with 110 confined in 1950. It is interesting to record that the majority of Malay police wives still prefer to return to the kampongs to have their babies. All the Gurkha mothers however now go to the Kandang Kerbau Hospital for confinement.

In addition to conducting a clinic at the Police Station in River Valley Road where there is a dispensary and examination room, the Lady Health Officer visits all the 42 stations in Singapore in regular routine.

There are still a few stations not supplied with pipe-water where the inhabitants have to depend on well-water.

GOVERNMENT MEDICAL STORE

During the year the Base Medical Stores carried on very smoothly its two main functions which are:—

- (a) as a bulk buying office and distributing centre for all the hospitals and clinics for supplies of drugs, dressings, textiles for uniforms and beddings, surgical instruments and other equipment; and
- (b) as a pharmaceutical manufacturing unit preparing emulsions, ointments, ampoules and multiple dose injections, saline packing, tablet manufacture, and the making of various tinctures and other pharmaceutical preparations. When a supply section works smoothly, it is working successfully, and since there were no major worries or upheavals over stocks running out or unobtainable at short notice, we may take the year as being the most successful since the end of the war.

The division was transferred to its new premises in Silat Road adjacent to the General Hospital during the latter part of the year.

The close of the financial year and stopping of store issues for annual valuation in December presented an opportunity to transfer detailed stocks to the new premises. With a proper store building it is at last possible to check in deliveries and to arrange these systematically, not too easy a task when there are 7,000 items of which 4,000 items have to be regularly recorded. It will be possible to issue supplies to hospitals and clinics much more expeditiously in future.

Apart from two large and airy storage buildings of the most modern design, a central block includes three administrative offices, a cold room for

sera and vaccines, and six rooms for manufacturing purposes. With all sections working in one compound with well-designed laboratories the Medical Store and pharmaceutical and manufacturing laboratories should be most efficient and able to cope with the expanding Medical Service. The laboratory section particularly can be expected to increase the output and range of manufactured products with a considerable consequent saving to Government.

The opening of this new organisation was accomplished in the nick of time. Without it, it would have been impossible to meet satisfactorily the needs of the steadily increasing pressure on an essential division of the medical scheme. Its advent prevented the necessity for the erection of temporary stores.

The vote for purchasing of stores was increased for 1951 to \$1,541,247 and following approval by Government, a further \$1,000,000 was added to enable bigger emergency reserves to be held. Stocks were carefully checked in January–February and considerable orders placed during the first three months, supplemented by further orders for textiles and other items later in the year.

Nearly \$300,000 was spent on local purchase: medical gases, X-ray films, locally manufactured rubber products, and coconut oil being amongst the main items.

No Board of Survey was held during the year. However now that the stores can be more easily checked, it is hoped to convene one early in 1952.

The supplies to Hospitals and other Government establishments, to the Singapore Anti-Tuberculosis Association, and to the University of Malaya, continued quite smoothly except for the short period when the department was closed for valuation of stock and for stores transfer. There were no serious hold-ups in supplies or shortages. Hospitals were asked to issue circulars pressing for economy in the use of such expensive drugs as aureomycin but this and other antibiotics were always available for cases which required them.

The total value of stores issued to all hospitals, clinics, dispensaries, etc. was between \$1,100,000 and \$1,200,000. Of this, approximately half represents issues of drugs and chemicals. Of the drugs and chemicals, antibiotics represent about half the total value of stocks issued, as illustrated by the following figures for values of some of the more important items:—

Antibiotics:

			\$	\$
Procaine Penicillin	...	...	88,800	
Sodium Penicillin	...	...	74,300	
Chloramphenicol	...	...	12,200	
Aureomycin	...	...	18,500	
Dihydrostreptomycin	...	...	82,500	
				276,300
Sulphathiazole and other sulpha drugs	...	...		29,300
Sodium P. A. S.	...	...		16,600
		Total	...	322,200
Staff uniform materials	...	...	49,000	
Patients' clothing, bedding, and other textiles	...	...	68,000	
X-Ray films	...	...	102,000	
Surgical dressings	...	...	48,000	
		Total	...	267,000

It will be seen that the value of sulpha drugs consumed is only about one-tenth that of the antibiotics, and the total value of the two major drugs in the treatment of tuberculosis—dihydrostreptomycin and sodium P.A.S.—is around \$100,000. Of stores other than drugs and chemicals, the four main items quoted above represent approximately half the total value issued.

Following the Government approval to purchase additional reserves in case of emergency, a Stockpile Purchase Planning Committee was convened and the purchase of reserves commenced. These purchases were in line with a scheme to increase the bed strengths of existing hospitals and to set up emergency cushion hospitals and treatment centres. In addition to extra reserves of normal supplies of drugs and chemicals and surgical sundries, extensive orders were placed for special burn and wound dressings, heavy stocks of bandages, gauze, cotton wool and similar essential requirements; also for human blood plasma substitutes, mattress and pillow materials and other bedding. Additional hospital ward bed cots were also ordered and arrangements made to buy stocks of a portable emergency bed, and extra X-ray equipment.

LABORATORY

Number of Works Tickets completed	1,300
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STORES AND SHIPPING

- (a) Number of Bills of Lading—166
- (b) Number of packages received (i) per freight—3,764
(ii) per post — 610
- (c) Number of parcels despatched (i) per sea — 63
(ii) per post — 51
- (d) Transport mileage—25,709 miles
- (e) Number of Crown Agents claims—156
- (f) Number of requisitions or invoices—4,448
- (g) Number of items in stock—4,246
- (h) Value of stores written off—\$166,405.71
- (i) Value of stores in stock—\$1,167,769

FINANCIAL

A. *Unallocated Stores:*

- (a) Value of local purchases—\$291,088.77
- (b) Value of purchases from neighbouring countries:—

				\$	c.
India	...	...	...	13,403	64
Australia	...	...	...	6,891	86
America	...	...	...	22,853	67
- (c) Value of orders placed on Crown Agents, i.e., Indents—\$1,728,566.15

B. *G.M.S. Maintenance:*

- | | | | | |
|---|-----|-----|--------|----|
| | | | \$ | c. |
| (a) Total O.C.A.R. | ... | ... | 17,970 | 08 |
| (b) Total O.C.S.E. (Ex. salaries and wages) | ... | ... | 20,140 | 35 |

Actual Expenditure:

- | | | | | |
|-------------------------|-----|-----|-----|-----------|
| | | | No. | Cost |
| | | | | \$ c. |
| (a) G.C.S. | ... | ... | 6 | 11,673 60 |
| (b) Medical Store staff | ... | ... | 55 | 51,535 18 |
| (c) Temporary staff | ... | ... | 13 | 12,954 19 |

Recoveries:

- | | | | | |
|--------------------------------------|---------------------|-----|-----------|----|
| | | | \$ | c. |
| (a) Total cost of stores billed | ... | ... | 1,184,485 | 97 |
| (b) Total bills outstanding | ... | ... | 19,202 | 67 |
| (c) Commission 10% | ... | ... | 2,106 | 67 |
| (d) Amounts paid (i) U.S. recoveries | ... | ... | 1,156,540 | 33 |
| | (ii) Revenue—Stores | ... | 37,877 | 10 |
| | Commission | ... | 2,066 | 99 |

Superintending Pharmaceutical Chemist: Mr. D. E. Lovett, B.PHARM. (Lond.),
P.H.C.

CIVIL MEDICAL DEFENCE

'Measures for safeguarding the civil population against the effects of war have become an essential part of the defensive organisation of the country. The need for them is not related to any belief that war is imminent. It is just as necessary that preparations for Civil Defence should be made in time of peace as it is that preparations should be made for the Armed Forces'.

The above is a quotation from the preface to a series of Civil Defence handbooks which have been produced in the United Kingdom under the authority of the Home Secretary by the Civil Defence Department of the Home Office.

The preface then goes on to point out the possibilities in the use of new weapons including the atomic bomb and draws attention to the risk that poison gas may be used though the use of such is forbidden by the Geneva Gas Protocol of 1925. A warning is made that 'it is most important that a proper balance is held between what is likely and what is possible'.

The Colony Government has likewise decided that measures should be taken to mitigate the effects of any likely attack, and has set up a Civil Defence organisation under a Commissioner for Civil Defence. It is proposed to recruit and train a Civil Defence Corps which will have, as in the United Kingdom, six sections:—Headquarters, Warden, Rescue, Ambulance, Pioneer and Welfare. In addition to the creation of a Civil Defence Corps, it is essential that other services must not only be maintained (medical and health, fire and the public utilities—water, electricity and gas), but must be prepared to meet any likely emergency.

In the case of the medical services it must be the aim to provide:—

(a) a continuation of the normal peace time hospital service for ordinary sickness and disease. Both the size and standards of treatment of the peace time service might have to be reduced to release manpower and accommodation for:—

(b) an expanded service to provide for all civilian war casualties.

The responsibility for the organisation of the hospital services in the Colony to meet an emergency has been placed on the Director of Medical Services.

The idea of a Civil Defence Medical Service in the Colony is not a new one, and many will remember the training instituted in the Colony in the middle thirties under the auspices of the St. John Ambulance Association. In those days considerable stress was laid on the possibility of the use of gas, and it was only later more thought was given to the provision of shelters, the bomb proofing of buildings, and protection from the effects of blast. In the event, the explosive missile and the incendiary were the 'weapons of choice' in Europe and Japan, while locally we had to face the destruction caused by bombs of small calibre, shell fire and, more particularly, the casualties caused by the use of anti-personnel bombs. The problem today, however, is very different. There is still the risk of the use of poison gas, but there is also the considerably enhanced destructive and casualty producing powers of new weapons including the atomic bomb. The scale of bombing in Singapore during 1941/1942 might, indeed probably will be, considerably exceeded in any future war and might approximate to the scale in the United Kingdom, Germany or Japan.

Perhaps from the medical point of view one of the most interesting points to have emerged from the experience gained in Great Britain is the importance of *first aid* as a measure in saving life. Not only was the importance of first

aid established, but it was found that under air raid and general war-time conditions, first aid itself presents a number of special problems which are not met with in the ordinary course of first aid in peace time. Air raids may occur at night and it is extremely difficult to make a detailed examination of a casualty or to attempt to apply elaborate treatment in the darkness and confusion occasioned by fires, the noise of bursting bombs, and the general destruction that may be going on all round. A system of first aid has therefore, been evolved with the primary object of rendering on the spot only such treatment as may be necessary to save life, to minimise shock, to relieve pain, to prevent the worsening of an injury, and to get the casualty from the scene of his injury to a place of safety where he can obtain skilled care and nursing as quickly as possible. So important is this subject now that every Civil Defence worker is required to take a course in first aid—either the Basic First Aid or the Full First Aid Course.

One of the primary aims therefore, must be to ensure that as many as possible receive a sound training in First Aid. It is fortunate in respect to such training in first aid that we have in the Colony a local centre of the St. John Ambulance Association. The Association played a prominent part pre-war in training people in first aid and home nursing, and holders of the certificates of the Association which are issued to people who attend a course and pass an examination in First Aid and Home Nursing, are eligible for enrolment in the St. John Ambulance Brigade. The Brigade is a uniformed body of trained personnel ready to serve the public on all occasions when accidents are likely to happen. The St. John Ambulance Brigade formed the nucleus of the Medical Auxiliary Service which played such a magnificent part in dealing with casualties and assisting in the hospitals when the Japanese attacked Singapore. After the war it was decided to re-form the Association and Brigade, and it is owing to the fact that the Colony Government realised the basic importance of the teaching and application of first aid that these organisations are today in a strong and flourishing condition. The Association, at the request of Government, has accepted responsibility for training the members of the Civil Defence Corps in first aid. It must be appreciated that the British Red Cross Society in Singapore has also its responsibilities. It is by mutual agreement between the two bodies that the training has been left to one body and the Association is today training members of the public in first aid on behalf of the local branch of the British Red Cross Society.

The importance of these voluntary organisations and the part they play in the Civil Defence Medical Services is stressed in order to emphasise the tremendously important role that can and will be played in Medical Civil Defence by the 'man-in-the-street'. The surgeon and the specialist may be the only people who can save the major casualty, but the minor casualty cannot only be helped, but even prevented from becoming a major casualty, by simple measures applied by trained people.

There is nothing mysterious or unknown about the effects produced by modern weapons, including the atomic bomb. The effects of blast, of flash, and of radiation, are not unknown and the treatment of any casualty is well within the competence of a qualified doctor. The problem is in organising the medical services to provide at any given time and place an adequate number of trained personnel to deal with the possible number of casualties. Nor is this a problem peculiar to the medical services—it applies to fire fighting, care of the homeless, and in fact to every aspect of Civil Defence—to provide adequate counter measures from available resources.

The 'Casualty Service' plan in the United Kingdom is the outcome not only of experience there during the war but of observing the conditions

produced by saturation bombing and atomic bombing in enemy countries. From the known effects of mass bombing and from a study of the state of affairs in enemy cities it has been concluded that there must be thorough dispersal of resources of every kind and that any major bombed area must be tackled from its periphery.

It has been decided in the United Kingdom to evacuate hospitals in city areas and to establish what have been called 'cushion' hospitals beyond the four mile limit from the city centre, and base hospitals as much further afield as space permits. It is further proposed to have 'recovery' hospitals even beyond the base hospital. It has also been agreed that the Fixed First Aid Posts of the last war meant immobilising staff and stores and that the number of such posts should be kept at a minimum. They should normally be set up either in or adjacent to 'cushion' hospitals or even base hospitals. Mobile First Aid Units are to be provided on a scale of one to 15,000 of the population. These will also be based on the hospitals. It is the intention that the staffs of these Posts and Units should be found from those working or being trained in the hospitals. The Mobile Units would stand to on an alarm and could be called upon as required. Thus it would be possible to move any number of Units into an area to deal with casualties.

Finally the plan calls for the minimum staffing of a certain number of the beds in the evacuated hospitals—so as to deal, pending attack, with local accidents and acute emergencies not permitting of transport, and to function as a First Aid Post in an attack. These 'front line' hospitals, it is suggested, might be called 'casualty transit hospitals', and the small staff should be assisted by those having first aid training who are obliged to stay in the area and by others drawn from the whole city.

The plan is that if an area is attacked the injured would receive initial first aid from Civil Defence Corps members—it might even be that the Rescue Sections might render first aid. Those obviously in need of hospital treatment would be taken by the Ambulance Section of the Civil Defence Corps direct to hospital. Others might be sent to the nearest First Aid Post or Casualty Transit Hospital, but in the main would be dealt with by the Mobile First Aid Unit which would be moved in as soon as possible, and which would set up a First Aid Post as near the scene of attack as possible. The lightest injured would just have a dressing and be sent home. Others would be treated and if necessary sent to hospital. Thus it is hoped to transfer the more seriously injured as rapidly as possible to hospital, while others could be dealt with on the spot and so relieve pressure on the hospitals.

The 'cushion' hospitals would provide urgent treatment and would aim at a rapid turn-over of patients in order to be prepared for the next attack. Patients who could not be discharged after a few days would be sent to a base hospital which would be in the safer areas and would cater for long stay cases. Other cases might be transferred to 'recovery' hospitals.

It is also planned to have mobile surgical and medical teams, gas cleansing stations, blood transfusion teams, an emergency maternity and other services.

It may be immediately appreciated that the 'Casualty Service' plan of the United Kingdom cannot be adopted 'in toto' locally. One serious difficulty is the fact that it is necessary to plan within the comparatively small limits of the Island.

It is essential to bear in mind the disastrous consequences when normal health services and standards are reduced. To mention but two diseases of primary importance the possibility of malaria outbreaks if the anti-malarial services on the Island should break down and the spread of bowel diseases should town cleansing services fail with resultant fly breeding.

Finally, there is one inescapable fact, and that is that any expansion of hospital services to deal with possible casualties is limited by the available medical manpower quite apart from problems of accommodation and equipment. It is accordingly proposed to recruit and train a Singapore Hospital Reserve and the terms and conditions of service are under active consideration. The question of providing reserves of drugs and equipment is being dealt with and, as a preliminary step, Government has set aside a sum of \$1,000,000 for this purpose.

(*Note*.—Dr. W. E. Hutchinson, M.D., D.P.H. (Dublin); E.D., J.P., to be appointed A.D.M.S. (Civil Defence) in early 1952.)

APPENDICES

APPENDIX I

THE FUTURE

REPORT OF A SELECT COMMITTEE OF THE LEGISLATIVE COUNCIL ON THE MEDICAL PLAN FOR SINGAPORE

Note:—The figures given in the Appendices to this Select Committee's Report bear no relation to present building costs which have considerably increased over the period. In addition the Plan has been modified by limiting the growth of the General and Kandang Kerbau Hospitals as explained in the text of the main report to 1,000 and 350 beds respectively with further expansion on a new site. The Bedok site being no longer available for the Sanatorium this expansion is planned elsewhere.

1. At a meeting of the Legislative Council held on 18th May, 1948, a Select Committee consisting of the Acting Financial Secretary, Mr. M. J. Namazie, Mr. C. C. Tan, Mr. P. F. de Souza and Mr. Lim Yew Hock was appointed to examine and report to the Legislative Council on 'The Singapore Medical Plan' prepared by Dr. W. J. Vickers, Director of Medical Services, Singapore, and set out in Council Paper No. 4 of 1948.

2. It is observed that the Plan was first placed before the Advisory Council as Council Paper No. 12 of 1947. In this Plan a total capital expenditure of \$51,082,000 was envisaged over a period of five years. Additional items amounting to \$7,736,000 were marked for consideration if possible. The date of this Plan is 11th February, 1947. It was necessary to review this Plan for two reasons; firstly, the impossibility of providing funds on such a scale over so short a period, and, secondly, the incapacity of the Public Works Department of the Colony to undertake so vast a task in addition to its normal works. In consequence, the Director of Medical Services, with the assistance of a Committee consisting of the Principal of the College of Medicine, the Chief Health Officer, the Chief Medical Officer, the Professor of Surgery, the Professor of Midwifery, Dr. Haridas and Dr. Nicholas, suggested some modifications to the original Plan in February, 1948. The original Plan, together with the modifications recommended by that Committee and a note by the Director of Medical Services on how the Plan arose, are all contained in the Council Paper first mentioned, namely, Legislative Council Paper No. 4 of 1948. The actual details of the Plan, arranged as a Ten-year Plan and as a Fifteen-year Plan, are shown in the Schedule on pages 26 and 27 of the Paper.

3. The Committee held meetings on the 7th and 17th of June, the 8th, 22nd and 30th of July, on the 12th August and on 8th September, 1948. The Director of Medical Services (Dr. Vickers) attended the meetings throughout and assisted us greatly with explanations and advice. The Director of Public Works (Mr. Kirk) and the Government Architect (Mr. Cuthbertson, and, later, Mr. Brundle), also attended most of our discussions and provided us at very short notice with numerous sketch-plans and figures; and the Committee wishes to acknowledge with gratitude the very valuable assistance given to us by these Officers. The Committee also paid a visit to the General Hospital and saw every aspect of the work there. This was most valuable to us not only for the practical view it enabled us to take of the particular problems there but also for the knowledge which it enabled us to apply to the consideration of other aspects of the Medical Plan generally. In addition, two members made a special visit to the Venereal Diseases Hospital, and the Chairman was able to give Members first-hand information gained by him in extensive inspection of the Leper Settlement, the Quarantine Station at St. John's Island and the Tan Tock Seng Hospital.

4. The Committee desires to state at once that the Medical Plan is one which, in our opinion, should, subject to the comments and modifications set out in this Report, be accepted. In this connection we wish to emphasise that we decided not to concern ourselves with the question to what extent the Colony can afford to execute this Plan. That is a question which it will be possible to answer only when all the other calls likely to fall upon the Colony during the next few years are known. There are many items in view—the University, Housing, Education and Social Welfare, Changi Air Port, etc.—which will make formidable demands upon the finances of the Colony. It will be necessary for all of them to be fitted into the picture before it can be seen in proper perspective. As regards the Medical Plan, the problem to us took the form of a simple question—Does Singapore need this Plan? And our answer to the question is 'Yes'. We agree with the opinion of the substantive Financial Secretary (Mr. J. D. M. Smith) as expressed in a Minute he wrote on the 29th December, 1947. In that Minute he stated:—

'..... I think that the correct approach to the Plan as a whole is first to discuss medical policy as such and on its merits, without intruding the financial

aspect. It is obvious that the Colony can never spend on medical services any more than it can afford to spend at any time on medical services. Therefore, once the main lines of medical policy are settled, the Colony then spends along those lines what it can afford to spend. And the breadth of those main lines of policy, in relation to the lines of policy in other fields, will determine the ratio of expenditure on medical services. The first step, therefore, is examination of the Plan on its merits as a statement of medical policy in the Colony

In stating our agreement with these views, we do not, of course, mean to infer that the amount which the Colony can afford to spend on medical (or for that matter other) services is necessarily to be governed by present revenue figures. It may be necessary, and probably will be necessary, to find additional funds to carry out this and other Plans. Some of this may have to be by additional revenue; some from loans. What we mean is that we have considered this Plan independently of financial considerations; we think that we should the better discharge the duties laid upon us by trying to arrive at conclusions as to whether the Plan is in itself a desirable plan of medical policy. The case for the Plan is fully and ably set out in the Council Paper, and we have no intention of trying to add further reasons to those already given. We consider that it is a desirable Plan, and not only desirable but necessary if the Government is to meet its obligations to the people of the Colony.

5. We should like at the outset to refer to one matter which intruded itself upon all our discussions. It is the question of quarters. It was quite clear to us that the question of the provision of quarters for the institutional staff of the Medical Department is one upon which most of the others depend. Until considerably more accommodation is available, extensions and improvements in other directions will be of no avail. The Committee which assisted Dr. Vickers have dealt with this aspect of the problem in paragraph 5 of their Report (Annexure B to the Plan). They say:—

‘Until more staff accommodation has been provided further recruitment and expansion is out of the question. The Committee wishes to bring this fact forcibly to the attention of Government: proper and up-to-date quarters for existing staff is first priority, and must take priority over further hospital expansion.’

We have made a close examination of this aspect of the Plan and have no hesitation in supporting the above opinion. We gather that the housing position of Government servants generally is unsatisfactory. Nevertheless we consider that the problem of accommodating hospital staffs takes priority over any general scheme. We consider, therefore, that medical quarters should be regarded not only as a part of the Medical Plan, but as its most urgent part.

In connection with the question of quarters, the Committee is unanimously of the opinion that a better type of quarters for the lower grades of hospital workers should be provided. We feel strongly that the building of the one-room type of quarters should be discontinued and that quarters with two rooms of somewhat smaller size should be provided in future.

6. We now deal with the individual items shown in the Schedule to the Plan:—

1. BASE MEDICAL STORE, PHARMACY SCHOOL AND ESSENTIAL MANUFACTORY

The purpose of this Store is to safeguard medical stores which arrive in the Colony, to make possible the local manufacture of expensive drugs with an ultimate saving to Government by so doing, and to concentrate the storage and manufacture at one point. We inspected the plans and the proposed site for this Store and approve them. We recommend that this item be included in the Plan. Further investigation has revealed that the building can be built and equipped for about \$450,000, which gives a probable saving of \$250,000 on the estimate shown in the Schedule to the Plan.

2. LEPER SETTLEMENT

The Committee is in entire agreement with the Director of Medical Services that the accommodation at the Leper Settlement is both inadequate and unsuitable. For these reasons, we consider that the amount of accommodation ought to be considerably increased and that the type of accommodation should be improved by progressively providing semi-detached quarters wherever desirable. Ancillary works in the form of roads, water supply and sewerage should also be provided. We investigated the estimates as far as it was possible for us to do so, and we agree that the estimate of \$780,000 is a fair one. The Committee was informed that this item has been entered as one for allocation of funds from the Colonial Welfare and Development Fund, and that it should stand a good chance of being accepted as such. We consider, however, that it is a proper item to be included in the medical Plan and that, therefore, it should stay in the Plan, irrespective of where the funds come from with which to implement it.

In making the above recommendation, the Committee assumed that the necessary extensions and improvements will be carried out on the present site at Yio Chu Kang. At a late stage in our discussions, however, the Committee was asked to consider a suggestion to remove the Settlement from its present site to one of the neighbouring islands. As no alternative investigations on these lines had been made, and as no information is available as to whether a suitable site could be found or as to what the project would cost if such a site were available, the Committee considered it undesirable to delay this Report for such investigations to be made. Moreover, for various reasons, the Committee considered that the extensions and improvements should be carried out on the present site. In the absence of information, Mr. C. C. Tan wishes to reserve his opinion on this point.

3. GENERAL HOSPITAL

This is the largest and most important item in the Medical Plan, and we are completely satisfied that it is necessary. We visited the hospital and thoroughly examined the proposed improvements and extensions. In the original plan two General Hospitals were envisaged, each to take 1,000 beds. This was to be achieved by modernising the present hospital at a cost of \$10,300,000 and by the building of a second hospital at a cost of \$21,500,000.

The Committee which assisted the Director of Medical Services early this year, upon reviewing this part of the Plan, recommended that the present General Hospital should be extended to take 1,500 beds to overcome the delay involved in implementing the original scheme. This recommendation was incorporated in the schedule to the Plan as item No. 3 at an estimated cost of \$16 millions, whilst a second item (No. 14) provided for one or two District Hospitals at a later date at an estimated cost of \$11 millions. These were to provide a further 500 beds. The main lines upon which the extension of the General Hospital is proposed are:—the provision of quarters, a proper out-patient Department and Clinics, an up-to-date Children's Block and a satisfactory Pathological Block.

As stated above, the cost of the proposed improvements and extensions at the General Hospital is shown at \$16 millions. We examined the estimates in detail and a breakdown of revised estimates is contained in Appendix 'A' to this Report. It will be seen that two-thirds of the estimates of expenditure are accountable to the building of quarters. We most emphatically agree. We are pleased to report that further investigation has shown that a saving of approximately six millions can probably be effected on this part of the Plan, but we would emphasise that final estimates cannot be given with complete accuracy until the fullest investigations are made. We strongly recommend that this item should be proceeded with without any more delay than is necessitated by the capacity of the Public Works Department to do the work. We consider that it is the most urgent need, and that, if the work can be pushed on with quickly, the building of District Hospitals, which we shall deal with later, can wait.

The Committee agrees with the recommendation at the end of paragraph 8 of the Report of the Committee which assisted the Director of Medical Services (Annexure B to the Plan) that the bed ratios among the different classes of patients should be 80 1st Class, 200 2nd Class and 1,220 3rd Class.

4. KANDANG KERBAU MATERNITY HOSPITAL

The Committee is entirely satisfied with the proposals for the extension of this hospital. Here again, the main cost will be on account of quarters. A breakdown of estimates is shown in Appendix B to this Report. A Schedule of proposed accommodation is shown in Appendix C from which it will be seen that the ward additions will give a bed ratio of 35, 77 and 410 as between classes I, II and III excluding provision for labour rooms (1st Class 3 bed size; 2nd Class 6 bedsize and 3rd Class 27 bed size) and isolation rooms (1st and 2nd Class, ten; 3rd Class 20 rooms).

5. RURAL CLINICS AND DISPENSARIES

The provision in this part of the Plan is for 16 clinics at \$41,000 each and three dispensaries (with quarters for Hospital Assistants and Hospital Attendants) at \$19,000 each. Thirteen of the Clinics will be established at the following places:—

Paya Lebar.	Pulau Bukom Kechil.
East Coast Road (8 mile).	Sembawang.
Thomson Road.	Pasir Panjang.
Ulu Bedok.	Pulau Brani.
Pulau Tekong.	Tempenis (5 mile).
Holland Road.	Jurong Road (17 mile).

Yio Chu Kang (6½ mile).

We agree that the choice of the three remaining sites should be left over until more information is available as to how the needs of the population will develop. The dispensaries will be sited at Changi, Sembawang and Pasir Panjang.

The need for these Clinics is stated in paragraph 13 of the Medical Plan and is the subject of severe comment in paragraph 16 of the Report of the Committee which assisted the Director of Medical Services (Annexure B to the Plan). We are satisfied with the need for the proposals made and agree that the distribution proposed is suitable. Ancillary work will cost a further 10 per cent, making \$784,000, a slight increase upon the estimate shown in the Plan.

Most of the expenditure for this item also, we were informed, has been entered for allocation under the Colonial Development and Welfare Fund, and the remarks we have already made in regard to the Leper Settlement apply to it.

6. ST. JOHN'S ISLAND WATER SUPPLY

We did not visit St. John's Island, but the Committee took note of the publicity that the Quarantine Station has received in the press and discussed the question at length in Committee. The problem of the water supply is a difficult one, and investigations are not yet completed. We consider, however, that the item is one that should be accepted. We were informed that it was hoped to receive an allocation covering the whole cost from Colonial Development and Welfare funds and the remarks we have made in regard to the Leper Settlement and the Rural Clinics and Dispensaries apply to this item. Until such time as fuller investigations can be made and firmer estimates prepared, we recommend that the provision of \$250,000 should stand in the Plan.

7. SCHOOL MEDICAL AND DENTAL CLINIC

The Committee discussed this item at some length, but the discussions turned mainly upon the site. We are entirely satisfied with the necessity for the provision of such a clinic, but consider that the closest attention should be paid to the choice of the most suitable site and that, if necessary, land should be purchased. The breakdown of figures for this work is as follows:—

	\$
Building	122,000
Piling	24,000
Staff Nurse Quarters (3)	25,000
Hospital Assistant Quarters (1)	15,000
Hospital Servants' Quarters (2)	9,000
Ancillaries at 10 per cent	19,600

making in all approximately \$215,000, a slight addition to the estimate as shown in the Plan.

The estimate for piling is, of course, based on the present site proposals, and if our recommendation for the investigation of a suitable alternative site is accepted, it is possible that the overall estimate can be reduced on this account.

This item is also included in the proposals for allocation under the Colonial Development and Welfare Scheme, and the remarks we have made in regard to such items apply to this one.

8. SEA AND AIR PORTS

It was explained to the Committee that a considerable amount of work would have to be done in the next few years if Singapore were to present its quarantine facilities as models, as it had done in the past. The work would fall into two parts, namely, the rehabilitation and extension of the quarantine station at St. John's Island and the provision of facilities at the new Changi Airport. The St. John's Island station was designed thirty years ago and in the main was satisfactory, but the neglect from which it had suffered during the war, and modern requirements in respect of quarantine, demanded complete rehabilitation. It is proposed that of the sixteen existing Camps eight should be reconstructed at a cost of \$400,000, and that the other eight should be rehabilitated at a cost of about \$152,000. The plans for quarantine arrangements at Changi Airport are not ready yet, but it was expected that something like \$270,000 would be required for this work.

The Committee agreed with these items. The Committee was informed that part of this work had been entered as one for an allocation of funds from the Colonial Development and Welfare Fund. The full amount could not be entered owing to the overall limit set for medical items in that scheme by the Singapore Committee dealing with the matter, but it was hoped to obtain sufficient money from the Fund to pay for one-half of the cost of the proposed work at St. John's Island. The remarks we have already made in regard to projects listed under the Colonial Development and Welfare Fund apply, therefore, to this item.

9. VENEREAL DISEASES HOSPITAL

Considerable discussion took place in the Committee in respect of this item, during which the desirability of making suitable provision at the General Hospital was considered as an alternative to having a Special hospital for the treatment of venereal diseases. The Medical Plan envisages a Hospital to accommodate 200 persons at a cost of \$4½ millions. The Committee eventually came to the conclusion that the building of a new Hospital to accommodate 200 persons should be postponed for further consideration in a few years time, that the work should continue to be done in the present hospital at Middle Road, but that the accommodation should be increased by making available those parts of the building that are at present used for staff accommodation, and building staff accommodation elsewhere. It was estimated that in this way accommodation could be increased from 50 to 120 beds. It was further considered that one clinic should be built at a suitable place, and that a travelling dispensary organisation should also be provided. The Committee recommends that the present buildings and the lands on which they stand should be acquired under the provisions of the Land Acquisition Ordinance.

It is, therefore, recommended that item 9 be omitted from the Plan for the time being and that a new item on the above lines be substituted. A breakdown of the Estimates is shown in Appendix *D* to this Report.

We desire to emphasise, however, that it may be necessary to reconsider this problem in a few years' time.

10. ORTHOPÆDIC HOSPITAL

In connection with this item the Committee would refer to the additional item on page 7 of Council Paper No. 4 of 1948, namely a Tuberculosis Hospital of 300 beds at an estimated cost of \$5,871,000. The Committee discussed the question of hospitalisation for tuberculosis at considerable length with reference to Council Paper No. 24 of 1948 prepared by the Director of Medical Services. After considerable discussion the Committee decided to recommend that the Medical Plan should contain provision for the building of a Sanatorium to include an Orthopædic section and that the present item should be deleted. We therefore asked for rough estimates to be prepared of the cost of such a hospital and these are set out in Appendix *E* to this Report. We accept these tentative estimates and recommend that this item, at a cost of \$2,217,000, should be substituted for the present item at a cost of \$1,100,000. In recommending the inclusion of this item in the Medical Plan we desire, however, to emphasise that it is not our intention that this should be a substitute for other measures in the fight against tuberculosis, namely the extension of Tan Tock Seng in the Medical Plan and the provision of other facilities in the ordinary Medical, Social Welfare and Education Departments' budgets. Tuberculosis, we are convinced, is a gigantic problem which can only be attacked successfully if attacked at every angle simultaneously, namely by better housing conditions, better feeding, school medical services, infant welfare, home treatment, etc. We therefore wish to state clearly that this item is recommended as an additional unit in the fight and not in substitution of those other methods of attack which we have outlined.

11. EXTENSION OF TAN TOCK SENG HOSPITAL

This item is shown in the Medical Plan as requiring \$1¼ millions. In Committee the Director of Medical Services asked for a reconsideration of the original scheme to enable the question of quarters to be tackled satisfactorily. The Plan envisages that the whole of the 800 beds at Tan Tock Seng Hospital should be devoted to use as a hospital-clinic for the treatment of Tuberculosis. A revised breakdown of estimates was produced to and examined by the Committee and is attached to this Report as Appendix *F*. It will be seen that the major part of the work is the provision of quarters. The Committee examined these proposals in detail and approved them. We therefore recommend that this item should stand in the Plan and that the estimate should be revised from \$1,758,000 to \$2,800,000.

12. RURAL LABOURERS' LINES

It was represented to the Committee that out of a total force of rural health labourers of 776, only 25 per cent were housed. We were informed that it is expected that the figure of 776 will remain fairly constant. The Committee were unanimously of the opinion that it should be an integral part of the Medical Plan to provide accommodation for all such labourers over a period of years. We also consider that quarters should be provided for Sanitary Inspectors, Technical Subordinates and other officers who are required to live in the area they serve. Revised estimates

show a reduction on the original estimate of \$2 millions for labourers' quarters of \$400,000 to \$1,600,000. If, however, the recommendation is accepted to provide quarters for Sanitary Inspectors and Technical Subordinates, a further amount of \$670,000 will be necessary, making \$2,270,000 in all.

We also consider that the description of this item should be changed to 'Health Department Housing'.

13. ANTI-MALARIA WORK

It was explained that this item cannot at present be allocated to any particular work, but is an attempt to make an intelligent forecast of special capital work which will be required in the future. Maintenance of present anti-malarial works is well-looked after by annual provision.

Although not an urgent matter, the Committee considered that the item should have a place in the Medical Plan if the picture of the future needs was to be correct. We therefore recommend its inclusion.

14. DISTRICT HOSPITALS

In view of the revision of item 3 relating to the General Hospital to provide for 1,500 beds instead of 1,000 beds as in the original 1947 Plan, and of the opinion expressed to us that patients generally preferred to go a longer distance to one good central hospital rather than a shorter distance to a secondary hospital, and of the desirability of waiting to see how the expansion of the town areas of Singapore might affect this problem, it was agreed that this item should be deleted from the Plan, but with a recommendation that the matter should be re-considered in a few years' time. This recommendation effects a reduction of \$11 millions.

15. EXPANSION OF INFECTIOUS DISEASES HOSPITAL

The Director of Medical Services explained that a Special Committee was being formed to consider this problem, jointly with the Municipal Health authorities. For these reasons it was agreed that until the problem was more fully resolved this item could be omitted from the Plan.

16. MENTAL HOSPITAL IMPROVEMENTS

Before the war there were 1,800 patients in this hospital. The number was considerably fewer now owing largely to the callous attitude adopted by the Japanese towards this type of infirmity. The Committee supports the Director of Medical Services in considering that planning on the basis of a population of 2,000 inmates was reasonable. The Committee also agreed that provision should be made for recreational facilities. A revised estimate of cost was produced to the Committee and is attached as Appendix G to this Report. We recommend that this item be included in the Plan and that the estimated provision be increased from \$1,880,000 to \$3 millions.

17. ADDITIONAL ITEM

In the course of its discussions the Committee was asked to consider an additional item not appearing in the Plan contained in Council Paper No. 4 of 1948. This is a proposal by the Director of Medical Services to establish a Mental Defectives Home to house 150 low-grade defective and feeble-minded children who, without proper care and control, are liable to become a danger to public peace and morality. These children cannot be dealt with in the same way as adults, nor is their problem the same as that connected with handicapped children who, apart from their physical infirmities, are mentally normal. The proposals has the complete support of this Committee, and an item of \$1 million has been entered in the Plan which we now recommend. A breakdown of the Estimates for this item is contained in Appendix H. The question of the site for this Home was discussed at length, and it was agreed that the Home should be separate and distinct from the Mental Hospital and that it should be constructed in an area which made this distinction clear, even though it may be necessary to acquire land for the purpose.

7. The Committee endorses the opinion expressed in paragraph 3 of the Report of the Committee which assisted the Director of Medical Services (Annexure B to the Plan) that a ten-year period should be the maximum in which the proposals contained in this Plan should be completed. We have been much impressed by the medical needs of the Colony, and therefore strongly recommend that the revised Plan which we have prepared and attach as Appendix I to this Report should be approved, and that it should be carried out within the period of ten years into which we have fitted it.

It will be seen that the Plan we recommend for adoption is expected to cost about \$33 millions compared with about \$50 millions as set out in the original Plan. The reasons for this are mentioned at their appropriate places in this Report, but we may summarise the main reasons briefly and approximately as follows:—

- (a) a saving on estimates for the General Hospital of \$6 millions;
- (b) a saving of \$2 $\frac{3}{4}$ millions on the proposals for the Venereal Diseases Hospital;
- (c) a saving of \$250,000 on the Medical Store;
- (d) a saving of \$11 millions on the proposals for District Hospitals;
- (e) a saving of \$1 $\frac{1}{2}$ millions on the proposals for Infectious Diseases.

Against these savings, however, there has to be set additional expenditure in connection with the Tuberculosis Sanatorium (\$1,000,000); extension at Tan Tock Seng (\$1,000,000); Health Department Housing (\$750,000); Mental Hospital improvements (\$1,000,000) and the Home for Mentally Defective Children (\$1,000,000).

In this connection we wish to emphasise two things. Firstly, some of the 'saved' items may have to be considered again at a later date; secondly, the figures given are not firm estimates. It would have been impossible for the work of this Committee to have been completed for a very long time if final lay-outs had had to be decided and final plans prepared. When this is done, some variations from the estimates given must be expected.

8. In conclusion we desire to record our thanks to our Secretary (Mrs. D. Alexander) for the able way in which she carried out her duties.

A. WILLIAMS, *Chairman.*

M. J. NAMAZIE.

C. C. TAN.

P. F. de SOUZA.

LIM YEW HOCK.

SINGAPORE, 12th September, 1948.

SINGAPORE GENERAL HOSPITAL

Alterations to Existing Buildings:—

			\$	\$
Additional Storey over Ward 4	...	...	265,000	
Additional Storey over Ward 5	...	...	265,000	
New Theatre block	...	...	300,000	
Air Conditioning for above	...	...	60,000	
Two new lifts and one shaft	...	...	47,000	
Electrical work to Foregoing	...	...	66,000	
			<hr/>	1,003,000
Alterations to existing Ward 1	...	...		20,000
Alterations to existing Ward 7	...	...		20,000
Alterations to existing Ward 10	...	...		20,000
Alterations to existing Ward 11	...	...		20,000
Alterations to X'ray Therapy and Theatres A and B	...	...		10,000
Additional Storey over Ward 17	...	...		300,000
Electrical work to last	...	...		22,500
Lift and Shaft to existing Theatre	...	...		27,000
Re-design Ward 14	...	...		25,000
Demolition of old buildings	...	...		40,000

New Works:—

Pathological Laboratory	...	...	350,000	
Piling	...	...	70,000	
			<hr/>	420,000
Out-patients Department	...	...		185,000
Children's 200 bed Wards	...	...		580,000
Laundry building	...	...	125,000	
Equipment	...	...	225,000	
			<hr/>	350,000
New Kitchens	...	...		100,000

Hospital Quarters:—

M.O's quarters 27 numbers at \$40,000	...	...		1,080,000
M.O's flats 34 numbers at \$35,000	...	...		1,290,000
Sisters and Matrons quarters—83 suites+6 rooms	...	...		800,000
Nurses hostel—110 rooms+10 Air Conditioned rooms	...	...		800,000
Hospital servants 323 quarters (2 room units) (if single room units \$1,250,000)	...	...		1,400,000
Laboratory Assistants and Dental Mechanics 20 single at \$5,500+20 married at \$15,000	...	...		410,000
15 garages and 12 quarters	...	...		70,000
Site Formation	...	...		50,000
Roads	...	...		200,000
Modernisation of electrical mains and substation	...	...		200,000
Modernisation of water supply	...	...		500,000
New Sewers	...	...		100,000
Acquisition of Land (not known)	...	...

10,042,500

KANDANG KERBAU HOSPITAL

APPENDIX B

Existing Administration Block:—

	\$
Three floors to be converted to provide 32 3rd class Ante Natal beds, Septic labour Room, 27 3rd class labour beds, creche and 48 3rd class maternity beds plus additional lavatory accommodation ...	60,000
Additional Storey to provide 64 3rd class maternity beds ...	200,000
Existing Out-patients Department converted to Nurses Quarters ...	10,000
Existing Maternity Block—converted to provide six 36 bed wards and extra lavatory accommodation ...	40,000
Electrical Work ...	11,000

New Building:—

Labour Wards for 3 1st Class 6 2nd Class and 27 3rd Class patients	
Maternity Wards for 25 1st Class and 50 2nd Class patients	
Gynæcology Wards for 10 1st Class 27 2nd Class and 50 3rd Class patients	
Theatres—One Large One Septic	
Kitchen and Stores—	
Administration—	
Out-patients—3 Departments Path. laboratory, Dispensary X'ray Room, Admission, Almoner's Office Secretary, Clerical Staff, Steward, Stores	
Matrons' Room ...	1,038,000
Electrical Work on New Hospital Building ...	95,000

Quarters:—

(1) Hospital Servants 360 Midwives 60	
420 two room units ...	1,856,000
(2) M.O's quarters—12 numbers at \$40,000 ...	480,000
(3) Hospital Assistants—10 married at \$15,000 and 4 single at \$5,000 ...	172,000
(4) Sisters and Nurses quarters:—	
Sisters 24 Matrons 4	
Nurses 28 suites plus 2 air conditioned rooms 75 single rooms 52 double rooms plus 6 air conditioned rooms ...	225,000
(5) Five Garages and nine syces quarters ...	953,850
	25,000

Ancillary Works:—

Piled foundations to all new buildings ...	945,000
Sewers to new building ...	50,000
Water supply to new building ...	8,000
Roads and two new bridges—Roads ...	\$70,000
Bridges ...	\$20,000
	90,000
Fences ...	6,000
Acquisition of Land (not known) ...	

	6,264,850
Contingencies ...	335,150
Total ...	6,600,000

KANDANG KERBAU HOSPITAL

SCHEDULE OF PROPOSED ACCOMMODATION

Existing Administration Block—

			<i>Beds</i>	<i>Beds</i>
Ground Floor—				
3rd Class Antenatal:				
Two 8 bed wards ...	...	...	16	
One 16 bed ward ...	...	...	16	
			<hr/>	32
A Septic Labour Room:				
First Floor—				
3rd Class Labour:				
Three 9 bed wards	...	...		27
Creche				
Second Floor—				
3rd Class Maternity:				
One 24 bed ward	...	...	24	
One 9 bed ward	...	...	9	
One 8 bed ward	...	...	8	
One 4 bed ward	...	...	4	
One 3 bed ward	...	...	3	
			<hr/>	48
Additional Storey—(New)—				
3rd Class Maternity:				
Two 32 bed wards	...	...		64
Existing Maternity Block—				
Six 36 bed wards	...	...		216
				<hr/>
		Total 3rd Class	...	387

New Building—

Second Class Maternity—				
Ten 5 bed wards ...	...	...	50	
Second Class Labour—				
Three 2 bed wards	...	...	6	
			<hr/>	56
First Class Maternity—				
Nine double wards	...	18 beds		
Seven single wards	...	7 beds		
			25	
Labour—Three Single Units	...	...	3	
			<hr/>	28
Isolation (All Classes)—				
Thirty cubicles ...	...	...		30
Gynæcology—				
3rd Class—Five 10 bed wards	...	...	50	
2nd Class—Three 9 bed wards	...	...	27	
1st Class—Ten single bed wards	...	...	10	
			<hr/>	87
		Total	...	588

SUMMARY

Class	Antenatal	Maternity	Labour	Gynæcology	Total	Isolation
1st ...	—	25	3	10	38	} 30
2nd ...	—	50	6	27	83	
3rd ...	32	328	27	50	437	
Total ...	32	403	36	87	558 + 30 = 588	

APPENDIX D

VENEREAL DISEASES HOSPITAL

Conversion of existing Venereal Diseases Hospital at Middle Road to accommodate
120 beds

	\$	\$
Existing Buildings:—		
Alterations and additions to three existing buildings ...		100,000
New Buildings:—		
Chief Medical Officer's House 1 ...	40,000	
Quarters for Medical Officers 5 ...	175,000	
Quarters for Sisters, Supervisor, Laboratory Assistants, Hospital Assistants and Clerks 42 ...	630,000	
Quarters for Nurses and Female Clerks 33 ...	264,000	
Quarters for Hospital Servants 46 ...	200,000	
Garages for 4 Ambulances ...	10,000	
Ancillaries ...	91,000	
		1,410,000
Clinic:—		
Building for Clinic ...	80,000	
Quarters for Medical Officers 2 ...	70,000	
Quarters for Hospital Assistants 6 ...	90,000	
		240,000
Total ...		1,750,000

APPENDIX E

NEW 300 BED T.B. HOSPITAL NEAR BEDOK—
PRELIMINARY ESTIMATE OF COST

	\$	\$
Hospital:—		
Three two storey Ward Blocks each of 100 beds at \$280,000		840,000
Administration block single storey ...		70,000
Kitchen block single storey ...		60,000
Covered ways ...		5,000
Electrical work ...		77,500
Quarters:—		
Senior M.O. ...	45,000	
2 A.M.Os. at \$35,000 ...	70,000	
1 Matrons quarters ...	35,000	
5 Sisters quarters ...	40,000	
35 Nurses quarters ...	270,000	
6 Hospital Assistants quarters ...	42,000	
8 Cooks, 80 Ward Staff, 10 Kebuns, 10 Artisans—Total 108 quarters ...	370,000	
		872,000
Ancillary Works:—		
Roads say one mile ...		47,500
Sewer and disposal plant ...		30,000
Water Supply ...		25,000
Site Formation ...		40,000
Contingencies ...		150,000
Total ...		2,217,000

TAN TOCK SENG HOSPITAL

\$

Improvements:—

Modern Sanitation to existing Mandalay Road Hospital and quarters	97,000
Re-roofing 18 wards and covered ways with asbestos, replacing corrugated iron	113,000

Quarters:—

Medical Officers Quarters—

Extensive repairs to 5 existing, new quarters 3 numbers ...	200,000
---	---------

Sisters quarters—

10 Sisters plus 1 Almoner—11 suites	88,000
--	--------

Nurses quarters—

Hostel for 60 Nurses (if Students' Hostel available no expenditure required on this item)	300,000
--	---------

Hospital Assistants quarters—

Extensive repairs to 19 married quarters	95,000
Extensive repairs to 12 single quarters	18,000
Extensive repairs to Bachelors Mess 12	10,000
New married quarters for 31 families	465,000
New single quarters for 6 single	33,000

Hospital Servants quarters—

New quarters for 172 families	745,000
New quarters for 88 single	340,000

Ancillary Works:—

Water Supply	30,000
Sanitation	75,000
Roads (say one mile)	47,000
Site formation	20,000

 2,676,000

Contingencies ... 124,000

 Total ... 2,800,000

APPENDIX G

MENTAL HOSPITAL

Essential Works—

	\$	\$
Two 50 bed wards	225,000	
Pantry to each ward	30,000	
Two T.B. wards	125,000	
Cold room of 1,000 cub. ft.	10,000	
New boiler house and move existing boilers, etc. ...	9,000	
Clerk and Stewards stores	100,000	
Garage, two vehicles and quarters for two drivers ...	12,000	

Quarters—

2 M.Os. at \$40,000	80,000	
6 Nursing Sisters and Matron	60,000	
12 Hospital Assistants or similar	120,000	
320 Hospital Servants	1,393,000	
32 Local Nurses	256,000	
4 Male Nurses	80,000	
		2,500,000

Desirable Works—

Modernisation of wards	120,000	
Two rooms for visitors	12,000	
Renovation of Male Workers Dining Room	2,250	
Store for farm implements, etc.	17,300	
Occupational Therapy	85,000	
Central recreation hall	80,000	
Work on Kitchens	10,000	
Gate Lodge	3,500	
Day rooms to two wards	30,000	
Airing Court to one female ward	1,000	
		361,050
Contingencies say	138,950	
		3,000,000

APPENDIX H

HOME FOR MENTALLY DEFECTIVE CHILDREN

	\$
150 bedded children's wards	435,000
Quarters for Medical Officer 1	40,000
Quarters for one Matron and five Sisters	50,000
Quarters for one Steward and two Hospital Assistants	45,000
Quarters for Hospital Servants 80	345,000
Ancillaries	85,000
Total	1,000,000

APPENDIX I

MEDICAL PLAN

Institution	1949	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10 year	Total
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
*1. Base Medical Store Pharmacy School and Essential Manufactory ..	145,000	152,000	153,000	..	..	..	..	..	..	..	..	450,000
†2. Leper Settlement ..	114,000	114,000	200,000	200,000	152,000	..	..	..	..	..	..	780,000
‡3. General Hospital ..	..	760,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,282,000	10,042,000
4. Kandang Kerbau Hospital ..	..	587,000	587,000	500,000	500,000	500,000	750,000	1,000,000	1,000,000	1,076,009	100,000	6,600,000
§5. Rural Clinics and Dispensaries	82,000	90,000	90,000	90,000	90,000	90,000	110,000	110,000	32,000	..	..	784,000
6. St. John's Island Water Supply	..	..	..	250,000	..	..	..	..	..	..	..	250,000
7. Medical and Dental School Clinic ..	..	215,000	..	..	..	..	..	..	..	..	..	215,000
8. Sea and Air Ports ..	..	..	200,000	200,000	100,000	100,000	72,000	150,000	..	..	..	822,000
9. Venereal Diseases Hospital ..	..	..	250,000	250,000	250,000	250,000	250,000	250,000	250,000	..	..	1,750,000
10. T.B. Sanatorium ..	..	..	750,000	750,000	500,000	217,000	..	..	..	..	..	2,217,000
11. Tan Tock Seng Hospital ..	..	288,000	250,000	250,000	250,000	500,000	500,000	500,000	..	262,000	..	2,800,000
12. Health Department Housing (\$100,000 (1948)) ..	100,000	100,000	100,000	200,000	200,000	200,000	200,000	300,000	300,000	200,000	370,000	2,270,000
13. Anti-Malarial ..	..	..	..	..	..	50,000	50,000	50,000	50,000	100,000	200,000	500,000
14. Mental Hospital ..	..	60,000	140,000	100,000	100,000	100,000	500,000	500,000	500,000	500,000	500,000	3,000,000
15. Mental Defective ..	..	..	..	200,000	200,000	200,000	200,000	200,000	..	..	..	1,000,000
Total Capital Expenditure ..	441,000	2,366,000	3,720,000	3,990,000	3,342,000	3,207,000	3,632,000	4,060,000	3,132,000	3,138,000	2,452,000	33,480,000
Approximate Annual Increase above present Annually Recurrent Expenditure ..	..	250,000	500,000	1,000,000	1,500,000	2,000,000	2,750,000	3,000,000	3,750,000	4,000,000	4,000,000	Expected annual increase in recurrent expenditure on completion of Plan—4, millions.

* Completed.

† Half completed.

‡ Foundation stone of new nurses home and new out-patient department laid at General Hospital.

§ Two nearing completion.

APPENDIX II FINANCIAL STATEMENT FOR 1951

(a) Receipts

Hospital Fees, etc. \$919,432.90

Medical General and Health \$296,429.85

Total \$1,215,862.75

(b) Payments

	Medical General	Hospitals and Dispensaries	Health Branch	Social Hygiene Branch	General Clerical Service	Government Medical Store	Total
Personal Emoluments ..	\$ 3,119,326 67	\$ 2,894,625 27	\$ 774,453 96	\$ 164,443 11	\$ 323,841 07	\$ 111,079 78	\$ 7,387,769 86
Other Charges, Annually Recurrent	25,553 20	3,316,198 64	631,086 28	129,450 19	..	895,858 69	4,998,147 00
Other Charges, Special Expenditure	73,990 41	217,560 06	27,188 99	8,198 43	..	38,677 17	365,615 06
Total ..	3,218,870 28	6,428 383 97	1,432,729 23	302,091 73	323,841 07	1,045,615 64	12,751,531 92

Notes:—(1) Payments include Contribution to Tan Tock Seng Committee.
(2) Above statement also includes cost of Indents on Crown Agents.

APPENDIX III
ANTI-MALARIAL WORKS CARRIED OUT IN THE YEAR 1951

		MATERIALS USED							WORK DONE IN YARDS						
No.	Locality	Sub-soil Pipes	Channels	Slabs	Bricks	Cement	A.M. Oil	DRAIN MAINTAINED		Sub-soil Pipe laid	DRAIN CONSTRUCTED		Drain Repaired Concrete	Sub-soil Pipe Repaired	
								Earth	Cement		Earth	Cement			
1	West Coast	1,420	374	359	2,550	138	4,620	20,200	12,250	450	510	..	761	835	
2	North West	664	155	70	8,670	178	6,526	82,092	9,337	159	106	2,576	6,246	6,315	
3	South West	1,326	251	485	4,684	219	12,993	39,020	56,338	418	..	167	1,202	6,604	
4	Central	131	263	333	8,065	144	4,125	124,984	6,710	..	2,993	265	897	685	
5	North East	1,611	703	337	1,677	227	10,534	592,075	96,693	1,334	2,939	166	3,197	6,008	
6	East Coast	2,252	1,332	2,206	4,070	206	9,900	33,540	20,770	537	948	1,088	712	1,736	
7	Town	200	..	..	1,500	10	..	..	3,600	..	..	..	..	625
Total		7,604	3,078	3,790	31,216	1,122	48,698	891,911	205,698	2,898	7,496	4,262	13,015	22,808	

APPENDIX IV

SUMMARY OF WORK CARRIED OUT BY DISTRICT SANITARY INSPECTORS
DURING 1951

I. INFECTIOUS DISEASES AND DISINFECTIONS

Number of cases of Plague	...	...	...	—
Number of cases of Small-pox	...	...	...	—
Number of cases of Cholera	...	...	...	—
Number of cases of Diphtheria	...	...	...	90
Number of cases of Measles	...	...	...	—
Number of cases of Enteric Fever	...	...	...	48
Number of cases of Chicken-pox	...	...	...	186
Number of cases of Yellow Fever	...	...	...	—
Number of cases of Typhus	...	...	...	13
Number of cases of Poliomyelitis	...	...	...	31
Number of cases of Leprosy	...	...	...	79
Number of cases of Tuberculosis	...	...	...	638

II. INSPECTION AND SANITATION

Number of inspections, house to house	—	...	...	17,151
Number of inspections, Police Stations	...	...	...	440
Number of inspections, Schools	...	...	...	1,723
Number of inspections, Government Buildings	...	...	...	1,315
Number of buildings with insanitary latrines	...	...	...	1,690
Number of buildings with insanitary urinals	...	...	...	266
Number of latrines inspected	...	...	...	19,283
Number of recommended reconstruction	...	...	...	1,188
Number of latrines abolished	...	...	...	398
Number of latrines constructed or reconstructed	...	...	...	610
Number of bored hole latrines constructed	...	...	...	8
Number of night-soil pails on removal list	...	...	...	6,410
Daily average amount of refuse in cubic feet	...	...	...	2,600
Number of village incinerators serviceable	...	...	...	11
Number of village incinerators unserviceable	...	...	...	2
Number of buildings with inadequate drainage	...	...	...	56
Number of linear yards drains cleared daily	...	...	...	72,237
Number of linear yards new earth drains dug	...	...	...	6,546
Number of linear yards masonry drains constructed	...	...	...	1,836
Number of linear yards masonry drains repaired	...	...	...	11,899
Number of linear yards subsoil drains constructed	...	...	...	1,742
Number of linear yards subsoil drains repaired	...	...	...	21,964

III. BUILDINGS

Number of permits issued	...	...	...	—
Number of permits rejected	...	...	...	6
Number of plans passed	...	...	...	349
Number of plans approved conditionally	...	...	...	16
Number of plans rejected	...	...	...	1
Number of new buildings erected	...	...	...	205
Number of buildings reconstructed	...	...	...	81
Number of buildings condemned	...	...	...	—
Number of buildings demolished	...	...	...	1

IV. FACTORIES, WORKSHOPS AND OFFENSIVE TRADES

Number of premises inspected	7,530
------------------------------	-----	-----	-----	-----	-------

V. FOOD

Eating Houses	...	...	...	...	10,554
Coffee Shops	...	...	...	...	1,776
Butcher Shops and Slaughter	...	...	...	...	57
Fishmongers	...	...	...	...	4,423
Grocers	...	...	...	...	3,845
Markets	...	...	...	...	2,888
Milk Vendors	...	...	...	...	1,503
Bake-Houses	...	...	...	...	2,242
Hawkers	...	...	...	...	6,140
Total inspections					33,428

VI. KEEPING OF ANIMALS

Cowsheds	...	...	...	...	1,986
Piggeries	...	...	...	...	5,214
Goat Pens	...	...	...	...	103
Total inspections					7,303

Nuisances in Cowsheds	...	...	...	...	243
Nuisances in Piggeries	...	...	...	...	3,068
Goat Pens	...	...	...	...	21

VII. GENERAL

Water—Number of samples taken for examination from wells, etc.	...	...	...	...	21
Rats—Number of rats submitted for examination	...	...	...	...	314
Complaints—Number received	...	...	...	...	342
Interviews with agents and owners	...	...	...	...	2,699
Number of intimation notices served	...	...	...	...	899
Number complied with	...	...	...	...	753
Number of nuisances notices served	...	...	...	...	451
Number complied with	...	...	...	...	375
Number of anti-mosquito notices served	...	...	...	...	134
Number complied with	...	...	...	...	107
Number of new lepers discovered	...	...	...	...	17

VIII. PROSECUTIONS

Total number	...	...	...	...	67
Results of prosecutions (Total fines)	...	...	...	...	\$2,195

APPENDIX V

IN-PATIENTS ALL HOSPITALS FOR THE YEAR 1951

The following table shows the hospitals maintained by the Medical Department, Singapore, the daily average number of patients in each, the number of patients admitted during the year, the total number of patients treated, the number of deaths and the death rate per hundred treated, (The Quarantine Hospital and Leper Settlement are not included).

Hospitals	Average No. of patients	Admissions during the year	CASES TREATED DURING THE YEAR			Deaths	Mortality per cent
			Male	Female	Total		
General Hospital	670.10	19,720	14,329	5,965	20,294	2,346	11.56
T.T.S.H. (T.B. and General)	514.89	1,346	1,484	365	1,849	245	13.25
K.K. Hospital	249.00	15,338 2,568	..	15,527 2,568	15,527 2,568	63	.35
Police Head Quarters	11.96	457	471	..	471	..	..
H. M. Prison Outram	42.50	1,234	1,262	..	1,262	2	.15
" Changi	23.00	276	292	..	292	..	..
Woodbridge Hospital	1,410.00	660	1,143	727	1,870	48	2.57
St. Andrew's Orthopedic Hospital	71.00	65	86	52	138	1	.73
Social Hygiene	55.00	2,633	2,117	559	2,676	5	.19
Middleton Hospital	101.00	2,217	1,466	851	2,317	160	6.90
Total (including 600 Transfers) .. .. .	..	46,514	22,650	26,614	49,264	2,870	5.83

N. B.—Total cases treated in 1950 : 45,365.

NOTE TO APPENDIX VI.

In the 1951 Report the form of the Return of Diseases and Deaths amongst in-patients in the hospitals, Colony of Singapore, has been changed. In previous years the form shows in the main the arrangement of the diseases in the International Nomenclature 1931 Edition, but this year in accordance with the instructions of the Secretary of State for the Colonies the Intermediate List of 150 causes for tabulation of morbidity and mortality statistics as published in the Manual of Classification Sixth Revision of the International Lists of Diseases and Causes of Death adopted by the world Health Organisation in Geneva in 1948 has been used.

2. This classification has been adopted with the object of securing such uniformity in morbidity and mortality statistics as can be achieved.

3. The Intermediate Lists has been expanded to suit the requirements of the Colony by making special sub-divisions of certain groups, for example, the group AE 140 accidental poisoning has been sub-divided into A to J giving a sub-division of the different forms of accidental poisoning.

HOSPITALS, COLONY OF SINGAPORE, IN-PATIENTS

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951

Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality (see Foot Note)

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>I.—Infective and Parasitic Diseases</i>						
A 1	001-008	Tuberculosis of respiratory system ..	422	1,649	281	2,071	444	
A 2	010	Tuberculosis of meninges and central nervous system ..	5	184	146	189	15	
A 3	011	Tuberculosis of intestines, peritoneum and mesenteric glands ..	1	38	12	39	1	
A 4	012.0, 013.0 012, 013 except 012.0, 013.0	Tuberculosis of bones and joints:—	38	77	6	115	40	
		Tuberculosis of the vertebral column ..	55	113	2	168	59	
		Tuberculosis of other bones and joints						
		Tuberculosis, all other forms:—						
A 5	014	Tuberculosis of skin and subcutaneous cellular tissue ..	..	..	..	..	..
	015	Tuberculosis of lymphatic system ..	..	28	1	28	2	
	016	Tuberculosis of genito-urinary system	2	15	1	17	2	
	017	Tuberculosis of adrenal glands ..	..	..	..	..	..
	018	Tuberculosis of other organs ..	4	18	4	22	3	
	019	Disseminated tuberculosis ..	..	52	38	52	1	
		<i>Carried forward</i> ..	527	2,174	491	2,701	567	

The headings are taken from the Intermediate List of 150 Causes for Tabulation of Morbidity and Mortality as published in the 'Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death' (Sixth Revision, 1948). Reference should be made to the Detailed List of the Diseases published on pages 45 to 321 of the above Manual whenever there is any doubt about the entry in the list.

* *i.e.*, the year previous to that for which the return is made.

† "Total cases treated" will, of course, include those remaining in Hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year's Return.

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	527	2,174	491	2,701	567	
		<i>I.—Infective and Parasitic Diseases</i> <i>—contd.</i>						
A 6	020	Congenital syphilis ..	4	215	10	219	1	
A 7	021.0-021.1	Early Syphilis:—	3	53	..	56	..	
	021.2	Primary syphilis ..	9	138	2	147	6	
	021.3	Secondary syphilis ..	..	..	..	..	..
		Early syphilis, relapse following treat- ment ..	..	..	..	..	..
	021.4	Early syphilis (unspecified stage) ..	..	..	..	..	..
A 8	024	Tabes dorsalis ..	2	8	..	10	2	
A 9	025	General paralysis of insane ..	3	7	..	10	2	
A 10		All other syphilis:—	1	9	1	10	1	
	022	Aneurysm of aorta ..	..	..	..	..	..
	023	Other cardiovascular syphilis ..	..	..	..	..	..
	026	Other syphilis of central nervous system ..	..	..	..	..	..
	027	Tertiary syphilis ..	8	244	2	252	9	
	028	Latent Syphilis ..	..	..	..	..	..
	029	Syphilis unqualified ..	14	889	11	903	9	
A 11		Gonococcal infections:—	1	258	..	259	..	
	030	Acute or unspecified gonorrhoea ..	..	..	..	..	..
	031	Chronic gonococcal infection of genito- urinary system ..	..	..	..	..	..
	032	Gonococcal infection of joint ..	4	20	..	24	..	
	033	Gonococcal infection of eye ..	1	48	..	49	..	
	034-035	Gonococcal infection of other sites ..	2	35	..	37	1	
A 12	040	Typhoid fever ..	3	133	15	136	36	
		<i>Carried forward ..</i>	582	4,231	522	4,813	634	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 13		<i>Brought forward ..</i> <i>I.—Infective and Parasitic Diseases</i> <i>—contd.</i>	582	4,231	522	4,813	634	
		Paratyphoid fever and other Salmonella infections:—						
	041	Paratyphoid fever A, B or C	..	2	..	2	..	
	042	Other Salmonella infections	..	..	..	..	..
A 14	043	Cholera	..	..	..	..	..
A 15	044	Brucellosis (undulant fever)	..	..	..	..	..
A 16		Dysentery, all forms:—	..	..	..	..	..
	045	Bacillary dysentery	1	25	4	26	1	
	046	Amoebiasis	6	121	8	127	8	
		Mixed	..	..	..	..	..
	047-048	Other protozoal and unspecified forms of dysentery	..	48	4	48	3	
A 17	050	Scarlet fever	..	..	..	..	..
A 18	051	Streptococcal sore throat	..	..	..	..	..
A 19	052	Erysipelas	..	6	..	6	1	
A 20	053	Septicaemia and pyaemia	1	60	39	61	..	
A 21	055	Diphtheria	29	473	94	502	18	
A 22	056	Whooping Cough	2	6	..	8	..	
A 23	057	Meningococcal infections	..	4	2	4	..	
A 24	058	Plague:—	..	..	..	..	..
	058.0	Bubonic	..	..	..	..	..
	058.1	Pneumonic	..	..	..	..	..
	058.2	Septicaemic	..	..	..	..	..
	058.2	Undefined	..	..	..	..	..
A 25	060	Leprosy	..	13	..	13	2	
		<i>Carried forward ..</i>	621	4,989	673	5,610	667	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	621	4,989	673	5,610	667	
		1.— <i>Infective and Parasitic Diseases</i> —contd.						
		Tetanus:—						
A 26	061	Tetanus of the new-born	1	19	16	20	.. 2	
	(a)	Tetanus, other forms ..	2	52	25	54		
	(b)							
A 27	062	Anthrax ..	..	..	..	..	..
A 28	080	Acute Poliomyelitis ..	45	81	9	126	34	
A 29	082	Acute infectious encephalitis ..	..	..	..	..	..
A 30	081 } 083 }	Late effects of acute poliomyelitis and acute infectious encephalitis ..	..	..	..	..	..
A 31	084	Smallpox ..	..	..	..	..	..
A 32	085	Measles ..	..	232	18	232	4	
A 33	091	Yellow fever ..	..	..	..	..	..
A 34	092	Infectious hepatitis ..	..	..	..	..	..
A 35	094	Rabies ..	..	..	..	..	..
A 36		Typhus and other rickettsial diseases:—						
	100	Louse-borne epidemic typhus ..	..	..	..	..	..
	101	Flea-borne epidemic typhus (murine) ..	..	1	..	1	..	
	104	Tick-borne epidemic typhus ..	..	..	..	..	..
	105	Mite-borne typhus ..	..	7	..	7	..	
	102-103 } 106-108 }	Other and unspecified typhus ..	..	20	..	20	..	
		<i>Carried forward</i> ..	669	5,401	741	6,070	707	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 37		<i>Brought forward</i> ..	669	5,401	741	6,070	707	
		<i>I.—Infective and Parasitic Diseases</i> <i>—contd.</i>						
		Malaria:—						
	(a) 110	Vivax malaria (benign tertian)	..	30	..	30	1	
	(b) 111	Malariae malaria (quartan)	..	2	..	2	..	
	(c) 112	Falciparum malaria (malignant tertian)	3	105	15	108	2	
A 38	(d) 114	Mixed malaria infections	1	4	..	5	..	
	(e) 115	Blackwater fever	..	..	..	..	..
	(f) 113	Other and unspecified forms of malaria	..	97	2	97	7	
	116-117 }	Schistosomiasis:—						
	123.0	Schistosomiasis vesical (S. haematobium)	..	..	..	..	..
	123.1	Schistosomiasis intestinal (S. Mansonii)	..	..	..	..	..
A 39 A 40	123.2	Schistosomiasis Pulmonary (S. Japonicum)	..	..	..	..	..
	123.3	Other and unspecified Schistosomiasis	..	..	..	..	..
	125	Hydatid disease..	..	..	..	..	..
		Filariasis:—						
	127	Onchocerciasis	..	..	..	..	..
	(b) ..	Loiasis	..	..	..	..	..
A 41 A 42	(c) ..	Filariasis bancrofti	..	22	1	22	1	
	(d) ..	Other filariasis	..	..	..	..	..
	129	Ankylostomiasis..	..	66	1	66	..	
		Other diseases due to helminths:—						
	126	Tape worm (infestation) and other cestode infestation	..	4	..	4	..	
		<i>Carried forward</i> ..	673	5,731	760	6,404	718	

APPENDIX VI—continued
 RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	673	5,731	760	6,404	718	
		<i>I.—Infective and Parasitic Diseases</i> <i>—contd.</i>						
A 42	(b) 130.0	Ascariasis	1	117	9	118	1	
	(c) 130.3	Guinea worm (dracunculosis) ..	..	..	..	..	..
	(d) 124	Other trematode infestation ..	..	..	..	..	..
	(e) 128	Trichiniasis .. .. .	..	..	..	..	..
	(f) 130.1-130.2	Other diseases due to helminths ..	..	21	..	21	..	
A 43		All other diseases classified as infective and parasitic:—	..	..	..	..	..
	(a) 036	Chancroid .. .. .	..	50	..	50	1	
	(b) 037	Lymphogranuloma venereum ..	..	51	..	51	1	
	(c) 038	Granuloma inguinale, non-venereal ..	5	741	..	746	1	
	(d) 039	Other and unspecified venereal diseases ..	..	55	..	55	1	
	(e) 049	Food poisoning infection and intoxication ..	..	7	..	7	..	
	(f) 059	Tularaemia .. .. .	..	..	..	..	..
	(g) 063	Gas Gangrene .. .. .	..	..	..	..	..
	(h) 064.2	Glanders .. .. .	..	..	..	..	..
	(i) 064.3	Melioidosis .. .. .	..	..	..	..	..
	(j) 064	Other bacterial diseases ..	..	..	..	..	..
	(k) 070	Vincent's infection .. .. .	..	17	2	17	..	
	(l) 071	Relapsing fever .. .. .	..	..	..	..	..
	(m) 072	Leptospirosis icterohaemorrhagica (Well's disease) ..	..	12	4	12	..	
	(n) 073	Yaws .. .. .	..	5	..	5	..	
	(o) 086	Rubella .. .. .	..	10	..	10	..	
		<i>Carried forward ..</i>	679	6,817	775	7,496	723	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	679	6,817	775	7,496	723	
		<i>I.—Infective and Parasitic Diseases</i> <i>—contd.</i>						
A 43	087	Chicken-pox ..	16	613	1	629	8	
(p)	088	Herpes Zoster ..	1	20	..	21	..	
(q)	089	Mumps ..	2	137	..	139	2	
(r)	090	Dengue ..	..	28	..	28	..	
(s)	093	Glandular fever ..	..	1	..	1	..	
(t)	095	Trachoma ..	3	66	..	69	2	
(u)	096.7	Sandfly fever ..	..	..	..	..	..
(v)	120	Leishmaniasis ..	..	..	..	..	..
(w)	121.0	Trypanosomiasis gambiensis ..	..	..	..	..	..
(x)	121.0	Trypanosomiasis rhodesiensis ..	..	..	..	..	..
(y)	121	Other and unspecified trypanosomiasis ..	..	..	..	..	..
(z)	121	Dermatophytosis ..	..	14	..	14	..	
(A)	131	Actinomycosis ..	..	3	1	3	..	
(B)	132	Other mycotic infections ..	..	1	..	1	..	
(C)	133,134	Scabies ..	2	116	..	118	7	
(D)	135							
(E)	054, 074							
	096.1-096.6	All other diseases classified as infective	..	2	..	2	..	
	096.8, 096.9	and parasitic ..	..				
	122							
	136-138							
		<i>Carried forward ..</i>	703	7,818	787	8,521	742	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	703	7,818	787	8,521	742	
		<i>II.—Neoplasms</i>						
A 44	140-148	Malignant neoplasm of buccal cavity and pharynx	3	37	4	40	3	
A 45	150	Malignant neoplasm of oesophagus	..	26	8	26	..	
A 46	151	Malignant neoplasm of stomach	1	101	37	102	4	
A 47		Malignant neoplasm of intestine except rectum:—						
	152	Malignant neoplasm of small intestine, including duodenum	..	1	1	1	..	
(a)	153	Malignant neoplasm of large intestine, except rectum	..	13	7	13	..	
	154	Malignant neoplasm of rectum	..	11	1	11	..	
A 48	161	Malignant neoplasm of larynx	..	5	2	5	..	
A 49	162-163	Malignant neoplasm of trachea, and of bronchus and lung not specified as secondary	..	30	17	30	..	
A 50		Malignant neoplasm of breast	1	35	6	36	..	
	170	Malignant neoplasm of cervix uteri	..	90	6	90	1	
A 51	171	Malignant neoplasm of other and unspecified parts of uterus	..	1	1	1	..	
A 52	172-174	Malignant neoplasm of prostate	..	9	..	9	..	
A 53	177	Malignant neoplasm of skin	..	9	3	9	..	
A 54	190-191	Malignant neoplasm of bone and connective tissue	..					
A 55	196-197							
A 56								
		<i>Carried forward</i> ..	708	8,186	880	8,894	750	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 57		<i>Brought forward ..</i>	708	8,186	880	8,894	750	
		<i>II.—Neoplasms—continued</i>						
		Malignant neoplasm of all other and un- specified sites:—						
	(a)	Malignant neoplasm of liver ..	2	52	33	54	1	
	(b)	Malignant neoplasm of pancreas ..	..	..	..	..	..
	(c)	Malignant neoplasm of peritoneum ..	..	1	..	1	..	
	(d)	Malignant neoplasm of unspecified di- gestive organs ..	..	20	1	20	4	
	(e)	Malignant neoplasm of other and un- specified female genital organs ..	..	20	4	20	..	
	(f)	Malignant neoplasm of other and un- specified male genital organs ..	2	28	4	30	1	
	(g)	Malignant neoplasm of kidney, bladder and other urinary organs ..	..	..	..	..	..
	(h)	Malignant neoplasm of all other and unspecified sites ..	12	151	30	163	10	
A 58 A 59		Leukaemia and Aleukaemia ..	1	22	8	23	3	
		Lymphosarcoma and other neoplasm of lymphatic and haematopoietic system:—						
	(a)	Lymphoarcoma and reticulosaroma ..	..	..	..	..	..
	(b)	Hodgkin's disease ..	..	11	1	11	1	
	(c)	Other neoplasm of lymphatic and hae- matopoietic system ..	..	..	..	..	..
		<i>Carried forward ..</i>	725	8,491	961	9,216	770	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	725	8,491	961	9,216	770	
		II.— <i>Neoplasms—continued</i>						
		Benign neoplasms and neoplasms of un- specified nature:—						
	210-211	Benign neoplasm of buccal cavity, pha- rynix and digestive system ..	..	..	..	..	..
A 60	(a)		..	173	1	173	..	
	217	Benign neoplasm of other female geni- tal organs ..	..	..	..	..	..
	218	Benign neoplasm of other male genital organs ..	..	..	..	..	..
	212-216 219-229 230	Benign neoplasm of other and un- specified organs and tissue ..	..	116	..	116	2	
	(d)	Neoplasm of unspecified nature of di- gestive organs ..	..	1	..	1	..	
	233-235	Neoplasm of unspecified nature of other female genital organs ..	..	20	..	20	2	
	231-232 236-239	Neoplasm of unspecified nature of other unspecified organs ..	2	32	2	34	..	
	(g)							
		<i>Carried forward ..</i>	727	8,833	964	9,560	774	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	727	8,833	964	9,560	774	
		III.— <i>Allergic, Endocrine System, Metabolic and Nutritional Diseases</i>						
A 61	250-251	Nontoxic goitre ..	..	43	..	43	1	
A 62	252	Thyrototoxicosis with or without goitre ..	2	98	5	100	12	
A 63	260	Diabetes mellitus ..	8	213	8	221	9	
A 64	280 281 282 283-284 285 286.0 286.5 286.1-296.4 286.6	Avitaminosis and other deficiency states:— Beri Beri .. Pellagra .. Scurvy .. Rickets .. Osteomalacia .. Sprue .. Malnutrition .. } Other deficiency states ..	1 1	43 2 1 14 20	16 1 2	44 2 1 15 20	2	
		<i>Carried forward</i> ..	739	9,267	996	10,006	798	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	739	9,267	996	10,006	798	
		IV.— <i>Diseases of the Blood and Blood- Forming Organs</i>						
		Anaemias:—						
A 65	(a) 290	Pernicious and other hyperchromic anaemias ..	..	30	2	30	.. 5	
	(b) 291	Iron deficiency anaemias (hypochromic) ..	..	18	1	18		
	(c) 292–293	Other specified and unspecified anaemias ..	11	123	10	134	10	
		Allergic disorders; all other indocrine, metabolic and blood diseases:—						
A 66	(a) 241	Asthma ..	10	213	6	223	3	
	(b) 240	Angioneurotic oedema, urticaria and other allergic disorders ..	..	.. 1	..	.. 1	..	
	(c) 242–245	Myxoedema and cretinism ..	..	..	..	..	..
	(d) 253	Other diseases of thyroid gland ..	..	..	..	..	..
	(e) 254	Disorders of pancreatic internal secretion other than diabetes mellitus ..	.. 1	.. 13	..	.. 14	..	
	(f) 271	Diseases of parathyroid gland ..	..	2	..	2	..	
	(g) 272	Diseases of pituitary gland ..	..	..	..	..	..
	(h) 273	Diseases of Thymus gland ..	..	.. 1	..	.. 1	..	
	(i) 274	Diseases of adrenal gland ..	..	..	..	..	..
	(j) 275–277	Other diseases of endocrine glands ..	..	.. 10	..	.. 10	..	
	(k) 288	Gout ..	.. 1	6	2	7	.. 1	
	(l) 287, 289	Other metabolic diseases ..	..	..	..	..	..
	(m) 294	Polycythemia ..	.. 1	..	..	.. 1	..	
	(n) 295	Haemophilia ..	..	..	..	..	..
		<i>Carried forward ..</i>	763	9,684	1,017	10,447	817	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 66		<i>Brought forward</i> ..	763	9,684	1,017	10,447	817	
		IV.— <i>Diseases of the Blood and Blood- Forming Organs—contd.</i>						
		Purpura and other haemorrhagic con- ditions ..	..	22	8	22	..	
	(o)	Agranulocytosis ..	..	..	..	..	..
	(p)	Diseases of spleen ..	..	8	2	8	..	
	(q)	Other diseases of blood and blood- forming organs ..	..	..	..	..	..
A 67		V.— <i>Mental, Psychoneurotic and Personality Disorders</i>						
		Psychoses:—						
		Schizophrenic disorders (dementia praecox) ..	..	..	..	..	..
	(a)	Maniac-depressive reaction ..	..	..	..	..	..
	(b)	Involutional melancholia ..	..	..	..	..	..
	(c)	Paranoia and paranoid states ..	..	..	..	..	..
	(d)	Senile psychoses ..	..	1	..	1	..	
	(e)	Other and unspecified psychoses ..	1,210	681	48	1,891	1,427	
	(f)	<i>Carried forward</i> ..	1,973	10,396	1,075	12,369	2,244	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 68		<i>Brought forward ..</i>	1,973	10,396	1,075	12,369	2,244	
		<i>V.—Mental, Psychoneurotic and Personality Disorders—contd.</i>						
		Psychoneurosis and disorders of per- sonality:—						
	(a)	Hysterical reaction ..	1	23	..	24	1	
	(b)	Neurotic-depressive reaction ..	..	..	..	..	..
A 69	(c)	Alcoholism ..	..	52	..	52	..	
	(d)	Other drug addiction ..	..	121	1	121	5	
	(e)	Other psychoneuroses and disorders of personality ..	..	6	..	6	..	
		Mental deficiency ..	..	..	..	..	..
		<i>VI.—Diseases of the Nervous System and Sense Organs</i>						
A 70		Vascular lesions affecting central nervous system:—						
	(a)	Cerebral haemorrhage ..	6	202	52	208	11	
		<i>Carried forward ..</i>	1,980	10,800	1,128	12,780	2,261	

APPENDIX VI—continued
 RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	1,980	10,800	1,128	12,780	2,261	
		<i>VI.—Diseases of the Nervous System and Sense Organs—contd.</i>						
A 70	332 (b) (c)	Cerebral embolism and thrombosis ..	..	..	..	..	..
	330	} Other vascular lesions affecting central nervous system ..	..	..	..	..	..
A 71	333-334	Non-meningococcal meningitis ..	.. 2	.. 85	.. 42	.. 87	.. 6	
A 72	340	Multiple sclerosis ..	..	..	..	..	..
A 73	345	Epilepsy ..	.. 2	.. 65	.. 2	.. 67	.. 3	
A 74	353	Inflammatory diseases of eye:—						
	370	Conjunctivitis and ophthalmia ..	3	128	..	131	2	
	371-379	Other inflammatory diseases of eye ..	..	..	..	..	..
A 75	385	Cataract ..	.. 11	.. 277	..	.. 288	.. 22	
A 76	387	Glaucoma ..	..	..	..	..	..
A 77	390	Otitis media and mastoiditis:—						
	391-393	Otitis externa ..	.. 1	17	..	17	.. 1	
	394	Otitis media and mastoiditis ..	..	84	..	85	..	
A 78		Other inflammatory diseases of ear ..	..	10	..	10	..	
		All other diseases of the nervous system and sense organs:—						
	380-384	} All other diseases and conditions of eye ..	45	716	2	761	34	
	386,388 389							
		<i>Carried forward</i> ..	2,044	12,182	1,174	14,226	2,329	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,044	12,182	1,174	14,226	2,329	
		<i>VI. Disease of the Nervous System and Sense Organs—contd.</i>						
		Intracranial and intraspinal abscess ..	1	3	4	4	..	
	342	Encephalitis, myelitis and encephalo- myelitis ..	2	60	22	62	3	
	243	Paralysis agitans ..	24	9	5	33	27	
	350	Other cerebral paralysis ..	..	..	..	..	..
	352	Motor neurone disease and muscular atrophy ..	..	..	..	..	..
	356	Other diseases of spinal cord ..	23	58	2	81	25	
	357	Other and unspecified forms of neural- gia and neuritis ..	4	33	1	37	1	
	366	Other diseases of cranial nerves ..	..	..	..	..	..
	367	Diseases of peripheral autonomic ner- vous system ..	..	..	..	..	..
	369	..	..	..	..	..	..
	341,344	} All other diseases of the nervous system and sense organs ..	4	136	2	140	11	
	351,354							
	355							
	360-365							
	368							
	395-398							
		<i>Carried forward</i> ..	2,102	12,481	1,210	14,583	2,396	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,102	12,481	1,210	14,583	2,396	
		VII.—Diseases of the Circulatory System						
		Rheumatic fever:—						
A 79	(a) 400	Rheumatic fever without mention of heart involvement ..	3	34	..	37	1	
	(b) 401	Rheumatic fever with heart involvement ..	1	58	16	59	1	
	(c) 402	Chorea ..	..	8	..	8	..	
		Chronic rheumatic heart disease:—						
A 80	(a) 410-413	Diseases of valves specified as rheumatic ..	..	..	..	..	..
	(b) 414	Other endocarditis specified as rheumatic ..	..	..	..	..	..
	(c) 415	Other myocarditis specified as rheumatic ..	..	..	..	..	..
	(d) 416	Other heart disease specified as rheumatic ..	..	..	..	..	..
		Arteriosclerotic and degenerative heart disease:—						
A 81	(a) 420	Arteriosclerotic heart disease, including coronary disease ..	3	52	22	55	1	
	(b) 421	Chronic endocarditis not specified as rheumatic ..	5	183	36	188	8	
		<i>Carried forward</i> ..	2,114	12,816	1,284	14,930	2,407	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,114	12,816	1,284	14,930	2,407	
		<i>VII.—Diseases of the Circulatory System</i> <i>—contd.</i>						
A 81	(c)	Other myocardial degeneration	..	..	..	..	..
A 82	(a)	Other diseases of heart:—	..	16	5	16	..	
	(b)	Acute and subacute endocarditis	..	5	4	5	..	
	(c)	Acute myocarditis	..	7	4	7	..	
	(d)	Pericarditis	..	14	3	17	3	
	(e)	Functional disease of heart	6	37	9	43	5	
A 83		Other and unspecified diseases of heart	..	67	32	67	..	
A 84		Hypertension with heart disease	..	225	39	235	9	
		Hypertensi on without mention of heart	10	10	4	12	..	
A 85	(a)	Diseases of arteries:—	2	..	..	..	..
	(b)	General arteriosclerosis	..	..	..	..	..
	(c)	Aortic aneurysm specified as non-syphilitic and dissecting aneurysm	..	..	..	..	..
	(d)	Other aneurysm, except of heart and aorta	..	..	..	..	..
	(e)	Peripheral vascular disease	..	..	..	..	..
	(f)	Arterial embolism and thrombosis	..	..	..	..	..
		Gangrene of unspecified cause	3	24	1	27	1	
		<i>Carried forward</i> ..	2,138	13,221	1,385	15,359	2,425	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 85		Brought forward ..	2,138	13,221	1,385	15,359	2,425	
A 86	456	VII.—Diseases of the Circulatory System — <i>contd.</i>	..	7	..	7	2	
	460,462	Other diseases of arteries	..					
	461	Other diseases of circulatory system:—	1	33	..	34	..	
	463–464	Varicose veins	1	288	1	289	6	
	465	Haemorrhoids	..	9	3	9	..	
	466	Phlebitis and thrombophlebitis	..	1	1	1	..	
		Pulmonary embolism and infarction	..					
		Other venous embolism and throm- sis	..	13	3	13	..	
	467	Other diseases of circulatory system	1	37	3	38	..	
	468	Adenitis, Lymphadenitis, and other diseases of lymph nodes and lymph channels	1	102	2	103	4	
A 87	470	VIII.—Diseases of the Respiratory System Acute upper respiratory infections:— Acute nasopharyngitis (common cold)	..	158	..	158	..	
		Carried forward ..	2,142	13,869	1,398	16,011	2,437	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,142	13,869	1,398	16,011	2,437	
		<i>VIII.—Diseases of the Respiratory System</i> <i>—contd.</i>						
		Acute sinusitis ..	..	84	..	84	..	
(b)	471	Acute pharyngitis ..	..	66	1	66	..	
(c)	472	Acute tonsillitis ..	..	609	1	609	2	
(d)	473	Acute laryngitis and tracheitis ..	..	28	..	28	..	
(e)	474	Other acute upper respiratory infections ..	2	82	..	84	2	
(f)	475	Influenza ..	3	60	..	63	..	
A 88	480-483	Lobar Pneumonia ..	4	293	22	297	7	
A 89	490	Broncho-pneumonia ..	3	490	269	493	4	
A 90	491	Primary atypical, other and unspecified pneumonia ..	6	68	7	74	9	
A 91	492-493	Acute bronchitis ..	3	142	3	145	2	
A 92	500	Bronchitis, chronic and unqualified:—						
A 93	501	Bronchitis unqualified ..	1	144	2	145	..	
(a)	502	Chronic bronchitis ..	2	46	3	48	3	
(b)	510	Hypertrophy of tonsils and adenoids ..	..	..	..	..	..
A 94		Empyema and Abscess of lung:—						
A 95	518	Empyema ..	4	37	8	41	2	
(a)	521	Abscess of lung ..	6	52	7	58	6	
(b)	519	Pleurisy ..	8	125	5	133	14	
A 96		<i>Carried forward</i> ..	2,184	16,195	1,726	18,379	2,488	

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 97		<i>Brought forward</i> ..	2,184	16,195	1,726	18,379	2,488	
		VIII.— <i>Diseases of the Respiratory System</i> — <i>contd.</i>						
		All other respiratory diseases:—						
	(a)	Other diseases of upper respiratory tract ..	..	192	..	192	..	
	(b)	Spontaneous pneumothorax ..	..	..	..	..	..
	(c)	Pulmonary congestion and hypostasis ..	..	1	..	1	..	
	(d)	Other chronic interstitial pneumonia ..	..	1	..	1	..	
	(e)	Pneumoconiosis ..	..	..	..	..	..
	(f)	Bronchiectasis ..	6	92	10	98	12	
	(g)	All other respiratory diseases ..	8	52	6	60	6	
A 98		IX.— <i>Diseases of the Digestive System</i>						
		Diseases of teeth and supporting structures:—						
	(a)	Dental caries ..	..	17	..	17	..	
	(b)	Gingivitis ..	1	71	..	72	1	
		<i>Carried forward</i> ..	2,199	16,621	1,742	18,820	2,507	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,199	16,621	1,742	18,820	2,507	
		<i>IX.—Diseases of the Digestive system —contd.</i>						
A 98	(c) 532.1	Pyorrhoea ..	..	..	..	..	..
	(d) 532.2	Other diseases of teeth and supporting structures ..	..	..	..	..	..
A 99	540	Ulcer of stomach ..	15	216	13	231	14	
A 100	541	Ulcer of duodenum ..	5	104	4	109	8	
A 101	543	Gastritis and duodenitis ..	2	115	..	117	8	
A 102	550-553	Appendicitis ..	9	773	13	782	9	
A 103	(a) 560	Intestinal obstruction and hernia:— Hernia of abdominal cavity without mention of obstruction ..	4	324	2	328	8	
	(b) 561	Hernia of abdominal cavity with obstruction ..	1	61	8	62	..	
	(c) 570.0	Intussusception ..	3	73	35	76	1	
	(d) 570.3	Volvulus ..	..	..	..	..	..
	(e) 570.1, 570.2, 570.4, 570.5	Other intestinal obstruction ..	..	..	..	..	..
A 104	..	Gastro-enteritis and colitis, except diarrhoea of the newborn:— Gastro-enteritis and colitis between four weeks and two years ..	11	747	343	758	14	
	(a) 571.0							
		<i>Carried forward ..</i>	2,249	19,034	2,160	21,283	2,569	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,249	19,034	2,160	21,283	2,569	
		<i>IX.—Diseases of the Digestive system</i> <i>—contd.</i>						
A 104	(b) 571.1	Gastro-enteritis and colitis, ages two years and over ..	8	285	33	293	3	
	(c) 572	Chronic enteritis and ulcerative colitis ..	..	..	..	..	..
A 105	(a) 581.0	Cirrhosis of liver:—	1	123	19	124	2	
	(b) 581.1	Cirrhosis of liver without mention of alcoholism ..	..	9	5	9	..	
		Cirrhosis of liver with alcoholism ..	..	..	..	..	..
A 106	(a) 584	Cholelithiasis and Cholecystitis:—	1	40	10	41	..	
	(b) 585	Cholelithiasis ..	3	73	4	76	6	
		Cholecystitis without mention of calculi ..	..	..	..	..	..
A 107	(a) 536	Other diseases of Digestive System:—	..	15	..	15	..	
	(b) 538	Stomatitis ..	..	..	..	..	..
	(c) 539.0	Other diseases of buccal cavity ..	..	49	3	49	..	
	(d) 539.1	Functional disorders of oesophagus ..	..	..	..	..	..
	(e) 544	Stricture or obstruction of oesophagus ..	5	137	6	142	5	
	(f) 545	Disorders of function of stomach ..	..	..	..	..	..
		Other diseases of stomach and duode-num ..	..	36	..	36	..	
	(g) 573.0	Constipation ..	..	..	..	..	..
		<i>Carried forward ..</i>	2,267	19,801	2,240	22,068	2,585	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,267	19,801	2,240	22,068	2,585	
		IX.— <i>Diseases of the Digestive system</i> — <i>contd.</i>						
		Other functional disorders of intestines	..	71	..	71	..	
A 107	(h) 573 except 573.0	Anal fissure and fistula ..	..	89	..	89	..	
	(i) 574	Abscess of anal and rectal regions ..	1	71	..	72	1	
	(j) 575	Peritonitis ..	1	52	25	53	1	
	(k) 576	Other diseases of intestines and peri- toneum ..	1	44	..	45	1	
	(l) 578	Acute yellow atrophy of liver ..	..	20	11	20	2	
	(m) 580	Other diseases of liver ..	6	264	29	270	7	
	(n) 583	Other diseases of gall-bladder and biliary ducts ..	..	25	2	25	7	
	(o) 586	Diseases of pancreas ..	..	3	2	3	..	
	(p) 587	Other diseases of digestive system ..	..	..	..	..	..
	(q) 537,542 577,582							
		<i>Carried forward ..</i>	2,276	20,440	2,309	22,716	2,604	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,276	20,440	2,309	22,716	2,604	
		<i>X.—Diseases of the Genito-Urinary System</i>						
A 108	590	Acute nephritis ..	8	138	17	146	13	
A 109		Chronic, other and unspecified nephritis:—						
(a)	591	Nephritis with oedema, including nephrosis ..					3	
(b)	592	Chronic nephritis ..	2	123	25	125		
(c)	593	Nephritis not specified as acute or chronic ..	1	56	17	57	10	
(d)	594	Other renal sclerosis ..					4	
A 110	600	Infections of kidney ..	5	214	11	219		
A 111		Calculi of urinary system:—						
(a)	602	Calculi of kidney and ureter ..	1	188	2	189	4	
(b)	604	Calculi of other parts of urinary system ..		47	1	47	2	
A 112	610	Hyperplasia of prostate ..						
A 113		Diseases of breast ..	1	26		27		
A 114	620–621	Other diseases of genito-urinary system:—						
(a)	603	Other diseases of kidney and ureter ..	1	44	1	45		
(b)	605	Cystitis ..		7		7		
(c)	605	Other diseases of bladder ..		41		41	2	
(d)	608	Stricture of urethra ..	1	48	1	49	1	
(e)	609	Other diseases of urethra ..	5	32	2	37	3	
(f)	612	Other diseases of prostate ..		177		177	3	
(g)	613	Hydrocele ..						
		<i>Carried forward ..</i>	2,301	21,581	2,386	23,882	2,649	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,301	21,581	2,386	23,882	2,649	
		<i>X.—Diseases of the Genito-Urinary System —contd.</i>						
		Orchitis and epididymitis ..	1	35	..	36	3	
A 114	(h)	Other diseases of male genital organs ..	1	89	..	90	5	
	(i)	Acute salpingitis and oophoritis ..	1	29	2	30	1	
	(j)	Other diseases of ovary and Fallopian tube ..	1	42	..	43	2	
	(k)	Diseases of parametrium and pelviperitoneum (female) ..	..	14	..	14	..	
	(l)	Infective disease of uterus, vagina and vulva ..	..	198	..	198	..	
	(m)	Other diseases of uterus ..	3	186	2	189	8	
	(n)	Disorders of menstruation ..	..	..	..	..	..
	(o)	Other diseases of female genital organs	3	201	..	204	7	
	(p)							
	(q)							
		All other diseases of the genito-urinary system ..	..	..	..	..	..
		<i>Carried forward ..</i>	2,311	22,375	2,390	24,686	2,675	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		† Total cases treated	‡ Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 115		<i>Brought forward</i> ..	2,311	22,375	2,390	24,686	2,675	
		<i>XI.—Deliveries and Complications of Pregnancy Childbirth and the Puerperium</i>						
	640	Sepsis of pregnancy, childbirth and the puerperium:—		5	..	5	..	
	641	Pyelitis and pyelonephritis of pregnancy	..	..	..	..	..
	681	Other infections of genito-urinary tract during pregnancy	..	71	1	74	7	
A 116	682	Sepsis of childbirth and the puerperium	3	..	..	..	..
	684	Puerperal phlebitis and thrombosis	..	..	..	..	..
		Puerperal pulmonary embolism	..	1	..	1	..	
	642.2	Toxaemias of pregnancy and the puerperium:—						
	642.3	Albuminuria of pregnancy	3	..	..	3	..	
A 117	642.4	Eclampsia of pregnancy	..	1	..	1	..	
	642.5	Hyperemesis gravidarum	..	40	1	40	..	
	642.5	Acute yellow atrophy of liver	..	..	..	..	..
	652	Other toxaemias of pregnancy	..	4	1	4	..	
	685	Abortion with toxæmia, without men- tion of sepsis	..	..	..	..	..
A 117	686	Puerperal eclampsia	..	..	..	..	..
		Other forms of puerperal toxæmia	..	..	..	..	..
	643	Haemorrhage of pregnancy and child- birth:—	..	..	..	..	..
		Placenta praevia	..	..	..	..	..
		<i>Carried forward</i> ..	2,317	22,497	2,393	24,814	2,682	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,317	22,497	2,393	24,814	2,682	
		<i>XI.—Deliveries and Complications of Preg- nancy Childbirth and the Puerperium—contd.</i>						
A 117		Other haemorrhage of pregnancy ..	2	..	..	2	..	
	(b)	Delivery complicated by placenta pre- via or antepartum haemorrhage ..	..	..	..	..	..
	(c)	Delivery complicated by retained pla- centa ..	..	..	..	..	..
	(d)	Delivery complicated by other post- partum haemorrhage ..	..	..	..	..	..
A 118		Abortion without mention of sepsis or toxaemia ..	..	..	..	..	..
	(e)	Abortion with sepsis ..	4	789	1	793	9	
A 119	644	Other complications of pregnancy, child- birth and the puerperium:—	1	121	1	122	2	
A 120		Ectopic pregnancy ..	..	63	3	63	2	
	(a)	Anaemia of pregnancy ..	..	..	..	..	..
	(b)	Pyrexia of unknown origin during the puerperium ..	..	..	..	..	..
(c)		Puerperal psychoses ..	..	2	..	2	..	
	(d)	Mastitis and other disorders of lacta- tion ..	..	..	..	..	..
(e)	688.1		..	..	..	..	..
	689		..	..	..	..	..
		<i>Carried forward</i> ..	2,324	23,472	2,398	25,796	2,695	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 120		<i>Brought forward</i> ..	2,324	23,472	2,398	25,796	2,695	
		XI.— <i>Deliveries and Complications of Preg- nance Childbirth and Puerperium—contd.</i>						
	(f)	647-649 673-680 687 688.0 688.2-688.3	10	4,833	45	4,843	9	
	(g)	Other complications of pregnancy, childbirth and the puerperium .. Delivery without complications ..	156	10,555	..	10,711	200	
A 121		XII.— <i>Diseases of the Skin and Cellular Tissue</i>						
		Infections of skin and subcutaneous tissue:—						
	(a)	Boil and carbuncle	1	132	1	133	..	
	(b)	Cellulitis and abscess	20	505	2	525	15	
	(c)	Other infections of skin and subcuta- neous tissue .. ..	..	14	..	14	..	
		<i>Carried forward</i> ..	2,511	39,511	2,446	42,022	2,919	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,511	39,511	2,446	42,022	2,919	
		XIII.— <i>Diseases of the Bones and Organs of Movement</i>						
		Arthritis and spondylitis:—						
		Acute arthritis due to pyogenic organisms ..	..	..	..	..	..
A 122	(a) 720	Acute nonpyogenic arthritis ..	..	..	..	..	..
	(b) 721	Rheumatoid arthritis and allied conditions ..	7	115	..	122	8	
	(c) 722	Arthritis specified and unspecified ..	..	..	..	..	..
A 123	(d) 723–725	Muscular rheumatism and rheumatism, unspecified:—	..	..	..	..	..
		Muscular rheumatism ..	..	..	..	..	..
	(a) 726	Rheumatism unspecified ..	..	..	..	..	..
	(b) 727	Osteomyelitis and periostitis ..	6	79	..	85	4	
A 124	730	Ankylosis and acquired musculoskeletal deformities:—	..	..	..	..	..
A 125	(a) 737	Anklosis of joint ..	..	..	..	..	..
	(b) 745–749	Other acquired musculoskeletal deformities ..	..	..	..	..	..
		All other diseases of skin and musculoskeletal system:—						
A 126	(a) 715	Chronic ulcer of skin (including tropical ulcer) ..	2	169	1	171	7	
		<i>Carried forward ..</i>	2,526	39,874	2,447	42,400	2,938	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 126		<i>Brought forward</i> ..	2,526	39,874	2,447	42,400	2,938	
		XIII.— <i>Diseases of the Bones and Organs of Movement—contd.</i>						
	(b)	} All other diseases of skin ..	14	396	4	410	14	
	(c)	} All other diseases of musculoskeletal system ..	6	80	1	86	5	
A 127		XIV.— <i>Congenital Malformations</i>						
	751	Spina bifida and meningocele ..	..	7	2	7	..	
A 128	754	Congenital malformations of circulatory system ..	1	45	23	46	..	
A 129		All other congenital malformations:—						
	(a)	Monstrosity ..	..	..	..	..	..
	(b)	Congenital hydrocephalus ..	..	5	4	5	..	
	(c)	Other congenital malformations of nervous system and sense organs ..	..	..	..	..	..
	(d)	Cleft palate and harelip ..	..	52	..	52	..	
		<i>Carried forward</i> ..	2,547	40,459	2,481	43,006	2,957	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
A 129		<i>Brought forward</i> ..	2,547	40,459	2,481	43,006	2,957	
		XIV.— <i>Congenital Malformations—contd.</i>						
	(e)	756.0 Congenital hypertrophic pyloric stenosis ..	..	1	1	1	..	
	(f)	756.1 Imperforate anus ..	2	15	6	17	..	
	(g)	756.2 Other congenital malformations of digestive system ..	..	..	..	..	..
	(h)	757 Congenital malformations of genito-urinary system ..	..	12	..	12	..	
A 130	(i)	758 Congenital malformations of bone and joint ..	..	4	..	4	..	
	(j)	759 Other and unspecified congenital malformations, not elsewhere classified	2	18	6	20	..	
	(a)	XV.— <i>Certain Diseases of Early Infancy</i> Birth injuries:—						
	(b)	760 Intracranial and spinal injury at birth .. 761 Other birth injury ..	.. ..	.. ..	.. ..	.. ..	.. ..
		<i>Carried forward</i> ..	2,551	40,509	2,494	43,060	2,957	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,551	40,509	2,494	43,060	2,957	
		<i>XV.—Certain Diseases of Early Infancy</i> <i>—contd.</i>						
A 131	762	Postnatal asphyxia and atelectasis	..	6	4	6	..	
A 132	764	Infections of the newborn:—	..	..	..	..	..
(a)	765	Diarrhoea of newborn ..	..	..	..	..	..
(b)	763	Ophthalmia neonatorum ..	..	..	..	..	..
(c)	766	Pneumonia of newborn ..	..	..	..	..	..
(d)	767	Pemphigus neonatorum ..	..	5	1	5	..	
(e)	768	Umbilical sepsis ..	1	6	1	7	..	
(f)	770	Other sepsis of newborn ..	..	..	..	..	..
A 133	769	Haemolytic disease of newborn	..	17	15	17	..	
A 134	771-772	All other defined diseases of early in- fancy ..	..	7	5	7	..	
A 135		Ill-defined diseases peculiar to early in- fancy, and immaturity unqualified:—	..					
(a)	773	Congenital debility ..	..	28	11	28	2	
(b)	774	Premature birth ..	..	60	42	60	..	
(c)	775-776	Other ill-defined diseases peculiar to early infancy and immaturity un- qualified ..	..	..	..	..	..
		<i>Carried forward ..</i>	2,552	40,638	2,573	43,190	2,959	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,552	40,638	2,573	43,190	2,959	
		XVI.—Symptoms, Senility and Ill-Defined Conditions						
A 136	794	Senility without mention of psychoses	2	20	4	22	2	
A 137		Ill-defined and unknown causes of morbidity and mortality:—						
(a)	780	Infantile convulsions ..	1	30	1	31	..	
(b)	788.8	Pyrexia of unknown origin ..	..	..	..	..	..
(c)	793	Observation, without need for further medical care ..	9	321	..	330	12	
(d)	795.1	Malingering ..	..	..	..	..	..
(e)	795.2	Sudden illness (cause unknown) ..	..	3	..	3	..	
(f)	795.3	Found dead (cause unknown) ..	..	..	..	..	..
(g)	795.0795.4 795.5	Other ill-defined and unknown causes of morbidity and mortality ..	50	1,305	43	1,355	87	
		<i>Carried forward ..</i>	2,614	42,317	2,621	44,931	3,060	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward</i> ..	2,614	42,317	2,621	44,931	3,060	
		XVII.—Accidents, Poisonings and Violence						
		“E” Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)						
AE 138	E810-E835	Motor vehicle accidents ..	26	668	74	694	24	
AE 139		Other Transport Accidents:—						
(a)	E800-E802	Railway accidents ..	..	..	..	..	..	Included under AE 139 (d).
(b)	E850-E858	Water transport accidents ..	..	..	..	..	..	Included under AE 139 (d).
(c)	E860-E866	Aircraft accidents ..	..	..	..	..	..	Includes AE 139(b) and AE 139(c).
(d)	E840-E845	Other transport accidents ..	47	725	33	772	39	
AE 140		Accidental poisoning:—						
(a)	E870	Accidental poisoning by morphia and other opium derivatives ..	..	2	1	2	..	
(b)	E874	Accidental poisoning by other analgesic and soporific drugs ..	..	6	..	6	..	
(c)	E878	Accidental poisoning by other and unspecified drugs ..	..	..	..	..	..
(d)	E883	Accidental poisoning by corrosive aromatics, acids and caustic alkalis	..	37	2	37	..	
		<i>Carried forward</i> ..	2,687	43,755	2,731	46,442	3,123	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,687	43,755	2,731	46,442	3,123	
		XVII.—Accidents, Poisonings and Violence —contd.						
		“E” Code Alternative Classification of Accident, Poisonings and Violence (External Causes)—contd.						
AE 140	(e)	Accidental poisoning by mercury and its compounds ..	..	..	..	..	..
	(f)	Accidental poisoning by lead and its compounds ..	..	3	..	3	..	
	(g)	Accidental poisoning by arsenic and antimony and their compounds ..	..	..	..	..	..
	(h)	Accidental poisoning by other and un- specified solid or liquid substances ..	1	46	1	47	..	
	(i)	Accidental poisoning by gases and vapours ..	..	5	1	5	..	
	(j)	Other accidental poisoning ..	..	..	..	..	..
		Accidental falls ..	29	954	71	983	30	
AE 141		Accident caused by machinery ..	..	54	1	54	..	
AE 142		Accident caused by fire and explosion of combustible material ..	5	123	9	128	1	
AE 143		Accident caused by hot substance, cor- rosive liquid, steam and radiation ..	8	171	4	179	6	
AE 144		<i>Carried forward ..</i>	2,730	45,111	2,818	47,841	3,160	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,730	45,111	2,818	47,841	3,160	
		XVII.—Accidents, Poisonings and Violence —continued						
		“E” Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—continued						
AE 145	E919	Accident caused by firearms	..	7	..	7	1	
AE 146	E929	Accidental drowning and submersion	..	9	..	9	..	
AE 147	E920	All other accidental causes:—	..	..	..	..	..
(a)	E920	Foreign body entering eye and adnexa	..	..	..	..	..
(b)	E923	Foreign body entering other orifice	..	..	..	..	..
(c)	E927	Accidents caused by bites and stings of venomous animals and insects	..	23	1	23	1	
(d)	E928	Other accidents caused by animals	..	29	..	30	1	
(e)	E913	Accidents caused by cutting or piercing instruments	..	89	..	89	1	
(f)	E914	Accidents caused by electric current	..	4	1	4	..	
(g)	E925	Accidental mechanical suffocation	..	..	..	..	..
(h)	E926	Lack of care of infants under one year of age	..	..	..	..	..
(i)	E931	Excessive heat	..	13	..	13	..	
(j)	E932	Excessive cold	..	..	..	..	..
		<i>Carried forward ..</i>	2,731	45,285	2,820	48,016	3,164	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		Brought forward ..	2,731	45,285	2,820	48,016	3,164	
		XVII.—Accidents, Poisonings and Violence —continued						
		“E” Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—continued						
AE 147	(k)	Hunger, thirst and exposure	..	..	..	..	..
	(l)	Cataclysm ..	..	..	..	..	..
	(m)	Lighting ..	..	2	..	2	..	
	(n)	Other and unspecified accidents	..	40	5	40	..	
	(o)	Vaccinia including post-vaccinal encephalitis	..	3	..	3	..	
	(p)	Other complications of smallpox vacci- nation	..	..	..	..	..
	(q)	Anaesthetic accidents	..	..	..	..	..
	(r)	Accidents due to medical or surgical intervention	..	..	..	..	..
	(s)	..	..	..	..	..	..
		All other accidental causes	1	43	..	44	..	
		..						
		Carried forward ..	2,732	45,373	2,825	48,105	3,164	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,732	45,373	2,825	48,105	3,164	
		XVII.—Accidents, Poisonings and Violence —continued						
		“E” Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—continued						
		Suicide and self-inflicted injury:—						
AE 148	E970	Suicide and self-inflicted injury by analgesic and soporific substances ..	..	..	..	..	..
(a)	E971	Suicide and self-inflicted injury by other solid and liquid substances ..	5	100	29	105	6	
(b)	E972	Suicide and self-inflicted injury by gases in domestic use ..	..	..	..	..	..
(c)	E973	Suicide and self-inflicted injury by other gases ..	..	..	..	..	..
(d)	E974	Suicide and self-inflicted injury by hanging or strangulation ..	..	7	2	7	..	
(e)	E975	Suicide and self-inflicted injury by submersion (drowning) ..	..	15	..	15	..	
(f)	E976	Suicide and self-inflicted injury by firearms and explosives ..	..	..	..	..	..
(g)	E977	Suicide and self-inflicted injury by cutting or piercing instruments ..	1	9	2	10	..	
(h)								
		<i>Carried forward ..</i>	2,738	45,504	2,858	48,242	3,170	

APPENDIX VI—continued

RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Intermediate List Number	Detailed List Number	Cause Groups (Diseases)	*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	†Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
		<i>Brought forward ..</i>	2,738	45,504	2,858	48,242	3,170	
		<i>XVII.—Accidents, Poisonings and Violence —cont.</i>						
		<i>“E” Code Alternative Classification of Accidents, Poisonings and Violence (External Causes)—cont.</i>						
AE 148	(i)	Suicide and self-inflicted injury by jumping from high places	..	1	..	1	..	
	(j)	Suicide and self-inflicted injury by other and unspecified means	2	3	..	5	..	
AE 149		Homicide and injury purposely inflicted by other persons (not in war):—						
	(a)	Non-accidental poisoning by another person	.. 8	.. 28	.. 2	.. 36	.. 1	
	(b)	Assault by firearms and explosives		87	3	88	1	
	(c)	Assault by cutting or piercing instru- ments	1	239	7	240	2	
	(d)	Assault by other means	..	..	..	..	..
	(e)	Injury by intervention of police	..	..	..	..	..
	(f)	Execution (legal)	..	..	..	..	..
	(g)	Infanticide	..	..	..	..	..
AE 150		Injury resulting from operations of war	..	..	..	..	..
		Grand Total ..	2,750	45,863	2,870	48,613	3,174	

APPENDIX VI—continued
RETURN OF DISEASES AND DEATHS FOR THE YEAR 1951—continued

Nationalities			*Remain- ing at end of 1950	YEARLY TOTAL		†Total cases treated	‡Remain- ing at end of 1951	Remarks
				Admissions	Deaths			
Europeans ..	..	..	30	1,199	23	1,229	25	
Eurasians ..	..	..	59	934	39	993	37	
Chinese ..	..	..	2,280	33,613	2,424	35,893	2,550	
Indians ..	..	..	183	6,782	261	6,965	348	
Malays ..	..	..	158	2,880	111	3,038	204	
Javanese ..	..	..	7	95	2	102	1	
Japanese ..	..	..	10	134	..	144	..	
Others ..	..	..	23	277	10	300	9	
Less healthy persons admitted to hospital to accompany children or friends ..	..	..	..	51	..	51	..	
Total ..			2,750	45,863	2,870	48,613	3,174	

APPENDIX VII

TABLE SHOWING MAIN CAUSES OF MORBIDITY OF IN-PATIENTS IN THE GENERAL HOSPITAL FOR THE YEARS 1951 AND 1950

Cause of Death	1951		1950	
	Admissions	Deaths	Admissions	Deaths
Enteric Group	78	9	100	16
Typhus	27	..	23	..
Malaria	192	15	214	17
Diphtheria	12	3	14	3
Influenza	47	..	67	1
Dysentery, Diarrhoea and Enteritis	937	370	898	360
Leprosy	2	..	12	..
Tuberculosis Respiratory System..	621	117	557	101
Other Tuberculosis Diseases ..	460	198	395	197
Cancer	666	138	574	137
Beri-Beri	38	13	26	8
Cerebral Haemorrhage ..	200	52	130	35
Diabetes	206	7	88	2
Bronchitis	275	8	202	13
Pneumonia all forms ..	787	289	800	382
Other Respiratory Diseases ..	448	35	598	44
Ulcer of Stomach, Duodenum, etc.	299	15	246	19
Ankylostomiasis	57	1	55	1
Other Intestinal Parasites ..	136	9	88	5
Appendicitis	754	13	574	15
Cirrhoeis of Liver	128	21	71	21
Acute and Chronic Nephritis ..	256	41	181	14
Venereal Affections	98	18	134	18
Congenital Debility, Malnutrition, Premature Birth, etc. ..	139	71	108	53
Suicidal	132	32	195	65
Other Forms of Violence ..	3,196	207	3,166	194
Other Diseases	9,529	664	8,506	651
Total ..	19,720	2,346	17,886	2,372

APPENDIX VIII

RETURN OF SPECIMENS EXAMINED IN THE CLINICAL LABORATORY
FROM JANUARY TO 31ST DECEMBER, 1951*Examination of Blood—Physiological*

Leucocyte Count	...	...	...	15,010	
Differential Leucocyte Count	...	...	...	14,927	
Erythrocyte Count	...	...	...	11,915	
Estimation of Hæmoglobin	...	...	...	12,749	
Blood Picture	...	...	...	269	
Blood Picture Myeloid Leukæmia	...	...	...	51	
Blood Picture Lymphoid	...	...	...	16	
Parasite Count	...	...	...	72	
Size of R.B.C. (Average)	...	...	...	195	
Reticulocyte Count	...	...	...	470	
Bleeding Time	...	...	...	381	
Coagulation Time	...	...	...	380	
Prothrombin Time	...	...	...	279	
Colour Index	...	...	...	42	
Blood Sedimentation Rate	...	...	...	6,036	
Fragility of R.B.C.	...	...	...	15	
Packed Cell Volume	...	...	...	677	
Mean Corpuscular Volume	...	...	...	4	
Mean Corpuscular Hæmoglobin Content	...	...	...	4	
Formalgel Test—Negative	...	...	...	17	
Chopra's Antimony Test—Negative	...	...	...	4	
Thrombocyte Count	...	...	...	324	
				<hr/>	63,837

Examination of Blood—Biochemical

Blood Urea	...	...	...	1,531	
Blood Cholestrol	...	...	...	175	
Blood Sugar	...	...	...	585	
Blood Uric Acid	...	...	...	58	
Blood Calcium	...	...	...	97	
Blood Phosphate	...	...	...	75	
Blood Icteric Index	...	...	...	964	
Blood Vanden Bergh reaction	...	...	...	964	
Blood Protein	...	...	...	733	
Blood Takata ara Test—Negative	...	...	...	242	
Positive	...	...	...	292	
Blood Chlorides	...	...	...	8	
Blood Glucose Tolerance Test—No. of Cases	...	...	...	348	
No. of Specimen	...	...	...	1,787	
Blood Creatine	...	...	...	1	
Blood Creatinine	...	...	...	1	
				<hr/>	7,861

Carried forward ...

71,698

				<i>Brought forward</i> ...	116,963
<i>Examination of Gastric Contents</i>					
Fractional Test Meal—611 cases	...	...	...	3,054	
For total Acidity and Cytology	...	...	...	7	3,061
Basal Metabolic Rate No. of Cases	...	...	...		523
Electrocardiogram No. of Cases	...	...	...		1,065
<i>Examination of Blood Films</i>					
Subtertian Malaria	...	...	...	386	
Benign Tertian Malaria	...	...	...	84	
Quartan	...	...	...	8	
Mixed Infection	...	...	...	11	
No Malarial Parasites	...	...	...	13,188	
Micro-Filaria Negative	...	...	...	889	
Positive	...	...	...	85	
Punctate Basophilia Negative	...	...	...	29	
Positive	...	...	...	2	
L.D. Bodies Negative	...	...	...	1	14,683
<i>Examination of Smears</i>					
Prostatic Smear for G.C. Negative	...	...	...	182	
Positive	...	...	...	1	
Urethral Smear for G.C. Negative	...	...	...	48	
Positive	...	...	...	3	
Vaginal Smear for G.C. Negative	...	...	...	73	
Positive	...	...	...	2	
Cervical Smear for G.C. Negative	...	...	...	31	
Eye Smear for G.C. Negative	...	...	...	40	
Positive	...	...	...	1	
Other organisms	...	...	...	46	
Throat and Nasal—for K.L.B. Negative	...	...	...	405	
Positive	...	...	...	15	
Other organisms	...	...	...	395	1,242
<i>Examination of Skin Scrapings</i>					
Fungi—Negative	...	...	...	70	
Positive	...	...	...	14	
L.B.—Negative	...	...	...	207	
Positive	...	...	...	83	
Scabies Parasites—Negative	...	...	...	15	
Positive	...	...	...	11	
L.D. Bodies—Positive	...	...	...	1	
Other organisms	...	...	...	132	533
<i>Examination of Sputa</i>					
Tubercle Bacilli—Negative	...	...	...	9,014	
Positive	...	...	...	559	
Other organisms	...	...	...	431	
Filaria	...	...	...	1	
Elastic Fibre	...	...	...	1	
Concentration Method for T.B.—Negative	...	...	...	3	
Positive	...	...	...	1	10,010
				<i>Carried forward</i> ...	148,080

<i>Brought forward</i> ...				148,080
<i>Examination of Stools</i>				
Amœba— <i>E. Histolytica</i>	...	...	...	65
<i>E. Coli</i>	...	...	...	8
<i>E. Nana</i>	...	...	...	1
<i>E. H. Cysts</i>	...	...	...	6
<i>E. Coli Cysts</i>	...	...	...	11
<i>Giardia Lamblia Cysts</i>	...	...	...	120
<i>Trichomonas Hominia</i>	...	...	...	65
Amœba—Negative	...	...	...	9,532
Occult Blood—Negative	...	...	...	1,785
Positive	...	...	...	1,068
Tubercle Bacilli—Negative	...	...	...	21
Positive	...	...	...	2
Sterobilin	...	...	...	2
Ova—Negative	...	...	...	11,681
Ova— <i>Ankylostoma</i>	...	...	...	1,580
Ova— <i>Ascaris</i>	...	...	...	2,755
Ova— <i>Trichuris Trichura</i>	...	...	...	423
Ova— <i>Oxyuris Vermicularis</i>	...	...	...	27
Ova— <i>Clonorchis Sinensis</i>	...	...	...	10
Ova—Anky and <i>Ascaris</i>	...	...	...	378
Ova—Anky and <i>T. Trichura</i>	...	...	...	153
Ova— <i>Ascaris</i> and <i>T. Trichura</i>	...	...	...	252
Ova—Anky, <i>Ascaris</i> and <i>T. Trichura</i>	...	...	...	72
Ova— <i>T. Trichuris</i> and <i>Oxyuris Vermicularis</i>	...	...	...	2
Ova— <i>Ascaris</i> and <i>Oxyuris Vermicularis</i>	...	...	...	5
Ova— <i>Ankylostoma</i> and <i>Oxyuris Vermicularis</i>	...	...	...	5
Ova—Anky, <i>Ascaris</i> , <i>O. Vermicularis</i> and <i>Hymenolepis</i>	...	...	...	1
<i>Nana</i>	...	...	...	1
Ova— <i>Hymenolepis Nana</i>	...	...	...	11
<i>Strongyloides Stercoralis</i>	...	...	...	1
<i>Tænia Saginata</i> Segments	...	...	...	...
Total ...				5,676
				11,681
				2,878
				9,532
				276
				148,080
				178,123

APPENDIX IX

OUT-PATIENTS

TOTAL ATTENDANCES AT THE OUT-PATIENTS CLINICS DURING THE YEAR 1951
WERE DISTRIBUTED AS FOLLOWS.

Hospitals	New Cases	Repetitions	Total Attendances
General Hospital	59,576	125,555	185,131
Kandang Kerbau Hospital	47,997	67,911	115,908
Tan Tock Seng Hospital Non-Tuberculosis	4,376	12,877	17,253
Tan Tock Seng Hospital Tuberculosis	1,936	56,471	58,407
Bukit Timah O.D.D.	13,976	14,979	28,955
Paya Lebar O.D.D.	7,120	7,879	14,999
Social Hygiene	15,958	108,872	124,830
Police Families	2,714	14,252	16,966
Total	153,653	408,796	562,449

APPENDIX X

PUBLICATIONS

Rheumatic heart disease in Singapore

A study of its clinical features, natural history, social pathology and morbid anatomy. E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

Aspiration biopsy of the liver

Khoo Oon Teik, L.M.S., to be published in due course.

Chloromycetin as a therapeutic agent in severe case of typhoid fever

Lim Toan Keng, L.M.S.

E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

British Medical Journal—Malaya Branch.

Clinical annotations

Two cases of severe serum reactions of an unusual nature, Three cases of leukæmia following pregnancy—British Medical Journal—Malaya Branch.

E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

Aminopterin in acute leukæmia

A study of its use in four cases of acute leukæmia—in course of preparation for publication.

Lim Toan Keng, L.M.S.

E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

The hemplegic state

E. S. Monteiro, M.D., M.R.C.P., F.R.F.P.S., D.C.H.

British Medical Journal—Malaya Branch.

